

# The IRON AGE

December 31, 1959

A Chilton Publication

The National Metalworking Weekly

A Special Year-End Report On:

## WORLD STEEL MARKETS

-Who's Gaining ..

-Changing Patterns ...

-The Russian Threat ...

**QUESTION:** Can W. Europe Absorb Its New Capacity? — P. 17

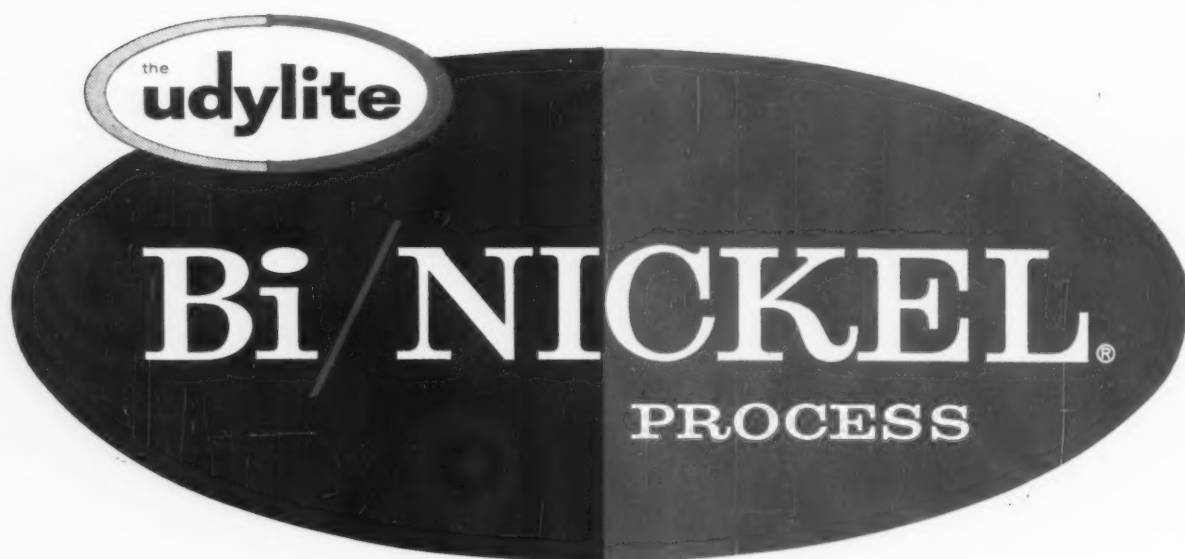
Metalworking's Market

For Epoxy Resins — P. 39

Cutting Total Costs — P. 20

Digest of the Week — P. 2-3

*Yes, there's an answer to corrosion, after all*



*The combination nickel that's making plating history*

*only from Bi/NICKEL do you get all these benefits*

**1 SUPERB CORROSION RESISTANCE**

Under actual exposure to highly corrosive atmospheres as well as accelerated CASS and Corrodokote tests Bi/NICKEL has proven its superiority over other bright nickel coatings.

**2 THE MOST BEAUTIFUL FINISH**

Color and brilliance obtained with Bi/NICKEL incorporating Udylite Bright Nickel, such as the Incomparable 66 and other Udylite nickel processes, cannot be matched.

**3 ADHESION PROBLEMS LICKED**

Bi/NICKEL offers a solution to adhesion problems previously considered inherent in combination nickel processes. Chrome finishes "take" to Bi/NICKEL with remarkable facility.

**4 FULL RANGE OF COMBINATIONS**

There is a version of Udylite's Bi/NICKEL which is adaptable to your product and problem whatever the demands of basis metal or the limitations of your already installed equipment.

**5 INCREASED PRODUCT POTENTIAL**

Here in Bi/NICKEL is a process that will immeasurably enhance the real value of the products to which it's applied. Longer life of usefulness and beauty can be expected from a Bi/NICKEL-Chromium finish. It gives you a real talking point when it comes to sales.

**6 ANSWERS CUSTOMER COMPLAINTS**

Bi/NICKEL is a step in the right direction toward solution of corrosion problems that have harassed automotive manufacturers and all others where corrosion has been a factor in a product's "life expectancy".

**Discover TODAY how the Udylite Bi/NICKEL process is just what you've been looking for to meet and beat your corrosion problem.**

*you get Bi/NICKEL only from*



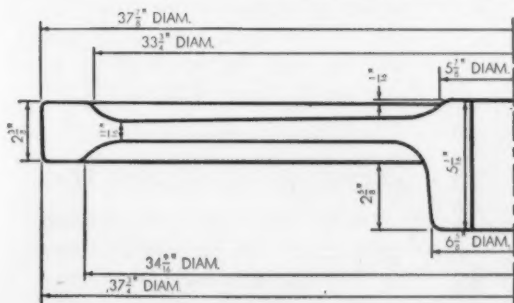
DETROIT 11, MICHIGAN  
WORLD'S LARGEST PLATING SUPPLIER



GEAR installed in hoist mechanism of Koehring Company power shovel.



EXCELLENT response to induction hardening? Take a look!



# This gear now costs \$35.24 less, THANKS TO BETHLEHEM CIRCULAR FORGINGS

"We are also very pleased with product machining properties, freedom from defects in the tooth area, and excellent response of the forging to heat treatment."

KOEHRING COMPANY, MILWAUKEE, WISCONSIN  
manufacturers of construction equipment

Koehring Co. previously machined this gear from a cast gear blank. Today they machine it from an impression-die steel forging made on Bethlehem's unique Slick Mill. They save \$29.24 in first cost, plus \$6.00 in machining costs! (Turning, boring, facing, and hobbing teeth.)

## Here's how we do it

The answer, of course, lies in Bethlehem's Slick Mill—the only one of its kind in the country. Quick die set-up (only 15 minutes)—quick operation (just one minute to forge and roll a circular product)—low die charges (1/3 to 1/2 less than conventional impression dies)—and less steel needed (utilizing the principle of forging design, the Slick Mill can produce lighter-weight sections without sacrificing strength) . . . all these add up to important savings. At the same time, the process insures *soundness, excellent grain flow, and machinability.*

Bethlehem's Slick Mill saves the Koehring Company \$35.24 per gear. How much can it save you?

Bethlehem Circular Forgings are available in carbon, alloy, or stainless steels, as well as certain heat-resistant grades. 10 to 48-in. OD. 100 to 2,000 lb. As-rolled, or rough-machined to specifications. Call or write the Bethlehem sales office nearest you for full details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

## BETHLEHEM STEEL

NOTICE the thin disc shape on this 395-lb gear blank. A cinch on the Slick Mill!



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# IRON AGE

The

December 31, 1959—Vol. 184, No. 27

## Digest of the Week in

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### NEWS ARTICLES

#### PLANEMAKER CUTS COSTS

**Others Can, Too**—Cost-cutting program started by an aircraft company has enabled the firm to reduce the cost of a new plane by



nearly 20 pct. And the company believes the cost reduction will eventually reach 30 pct. There's no reason why other metalworking companies can't install similar programs. P. 20

#### STEEL PRICES

**Increases Possible**—Comments hinting possible price increases have stirred up a burst of speculation. If a steel labor settlement is mandated, price hikes are a possibility. And it looks like a mandated settlement may be the inevitable result. At the same time, price talk will be used by steelworkers as propaganda in negotiations. P. 21

#### REPORT TO MANAGEMENT

**Debate Over Growth**—Russian competition has put the spotlight on U. S. efforts to increase produc-



# Metalworking



## COVER FEATURE

**World Steel** — The world steel map is undergoing a big change. West European steelmakers are revising their product and marketing philosophies. At the same time, Russia continues to make major production strides. P. 17

tivity. But there are other equally strong reasons for faster growth rate. P. 25

## GAS TURBINES

**Will They Make It?**—The gas turbine is still waiting around to replace the piston engine. Another new "jet" offers excellent weight-to-horsepower. But is it enough? P. 27

## FEATURE ARTICLES

### EPOXY RESINS

**Broader Markets** — Scan down the list of some of the present-day uses of epoxy resins and you wonder why more companies aren't using them. Yet, big companies are investing in epoxies right now. The reason is obvious. Generous savings are involved. P. 39

### CUT CARBIDE SEGREGATION

**In High Speed Steels**—The ultimate goal in the production of high speed steels is to get a product with the least amount of carbide segregation. Research points out ways to minimize this problem, thereby discouraging premature failure in tools. P. 42

### HIGH STRENGTH STAINLESS

**In Tubular Shapes**—AM-350, a high strength stainless steel, is now being formed into tubular shapes. Key to the success is the close control over drawing and annealing techniques. The material is welded

by the tungsten inert-gas arcwelding process. P. 44

## GIANT PLATE STRETCHER

**Improves Properties**—There's a lot behind the idea of stretching a 60-ft plate into a 64-footer. A 15,000-ton machine does it, making aluminum alloys easier to weld and heat treat. This unit can stretch maximum cross sections of 640 sq in. P. 45

## SPECIAL MACHINERY

**Widen Its Function**—Instead of letting special machine tools gather dust when they've done their work, a few extra features can put them back to work in a variety of tough jobs. Here, it saves in setup and machining costs. P. 48

## MARKETS & PRICES

### NORTHWEST

**The Economy**—Businessmen in the Pacific Northwest are facing a decline in industrial growth except

in manufacture of aircraft and missiles. They're waiting to see if this industry will prove a stable element in the area business picture. P. 32

## AUTOMATION IN 1960's

**Smaller, Special Purpose** — Big transfer lines are typical of automation in the 1950's. Interest is now shifting to smaller, special machines that can do things other machines can't. P. 35

## STEEL SUMMARY

**Market Clouded** — Uncertainties have the market up in the air. A new strike Jan. 26 is not out of the question unless the government comes up with a plan of action. Competition for all tonnage is intense. P. 75

## PURCHASING

**Know Markets**—An experienced PA says if you are buying primary materials your best bet is to know as much about markets and marketing as the sellers. P. 62

## NEXT WEEK — Annual Forecast Issue

**Planning for '60**—Next week's annual issue contains three major guides to business:

**Executives Survey**—From some 20 major industries give the outlook for sales, prices and profits.

**New Market Tool**—A new study of steel distribution by consuming industries for major steel products listed by states and SIC codes.

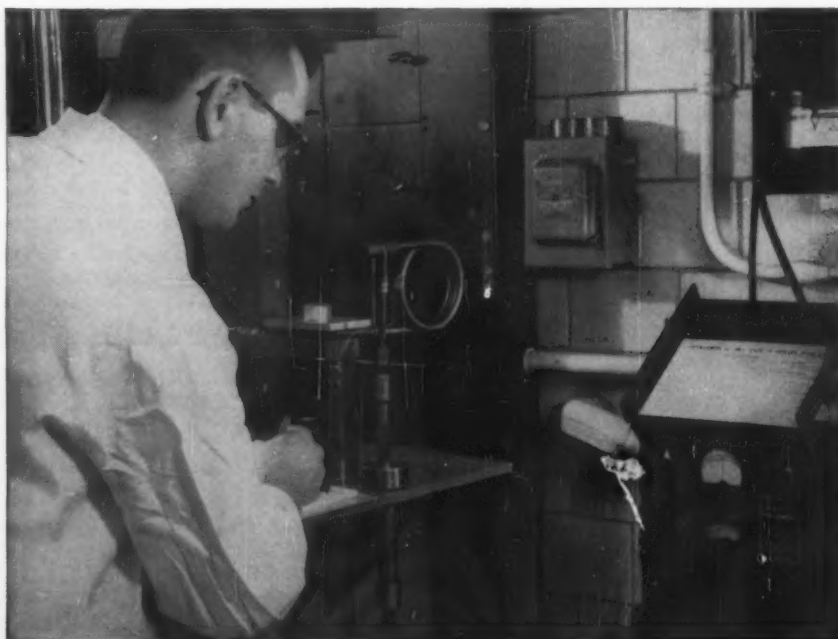
**Ten-Year Outlook** — A forecast for business over the next decade.

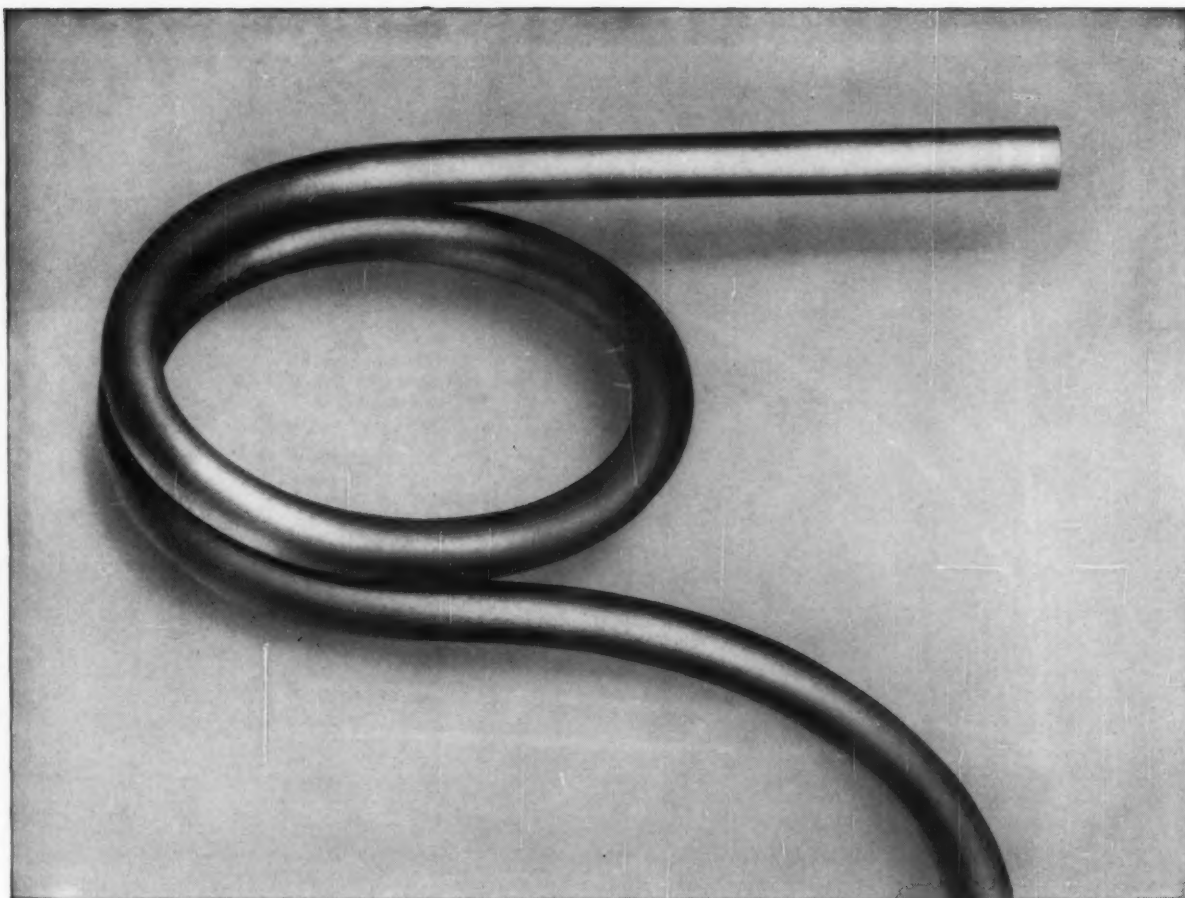


20,000 chairs rock on  
**USS** American Springs  
without one failure

...thanks to AS&W

In the American Steel & Wire Spring Testing Laboratory, the springs recommended for the Homecrest Chair go through extensive tests. This Fatigue machine, by means of strain-gauge verification, simulates years of use in a relatively short testing time.





Here is the spring recommended by American Steel & Wire for use in this chair. To supplement the AS&W tests, the Homecrest Company subjected these springs to a simulated rocking test. Under a weight of 250 pounds, these springs were rocked 750,000 times, without failure.

## Spring Engineering Research Service

The Homecrest Company, Wadena, Minnesota, wanted to add a swivel rocking chair to their line of modern, functional home furniture. However, they would produce this chair only if it could be a quality item that would give good, dependable service. While designing the chair, they checked with the American Steel & Wire Spring Engineering Consulting Service. The engineers studied the problem, ran extensive tests and finally recommended a pair of round wire helical single coil torsion springs. Using these springs, Homecrest designed, fabricated and marketed the chair. Today 20,000 of these chairs have been sold and not one failure of an AS&W Spring has been reported.

Mr. A. L. Englemann, a partner of Homecrest Company, says, "We have purchased from American Steel & Wire over 45,000 springs, and not one has been reported a

failure. We couldn't be happier with American Steel & Wire as a supply source for our springs."

If you have a spring problem, or would like advice on the use of springs in your product, get in touch with any American Steel & Wire Sales Office. You can benefit from the knowledge of AS&W's Spring Engineering Research Service. The Service has been engaged in laboratory experiments of static and dynamic testing for 20 years and has accumulated invaluable data on stress and fatigue life of steel springs, while endeavoring to improve efficiency in the use of steels, from steel chemistry through product application, to more economically cope with today's rigorous demands. This accumulated knowledge of the AS&W Spring Engineering Research Service is at your disposal. American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio.

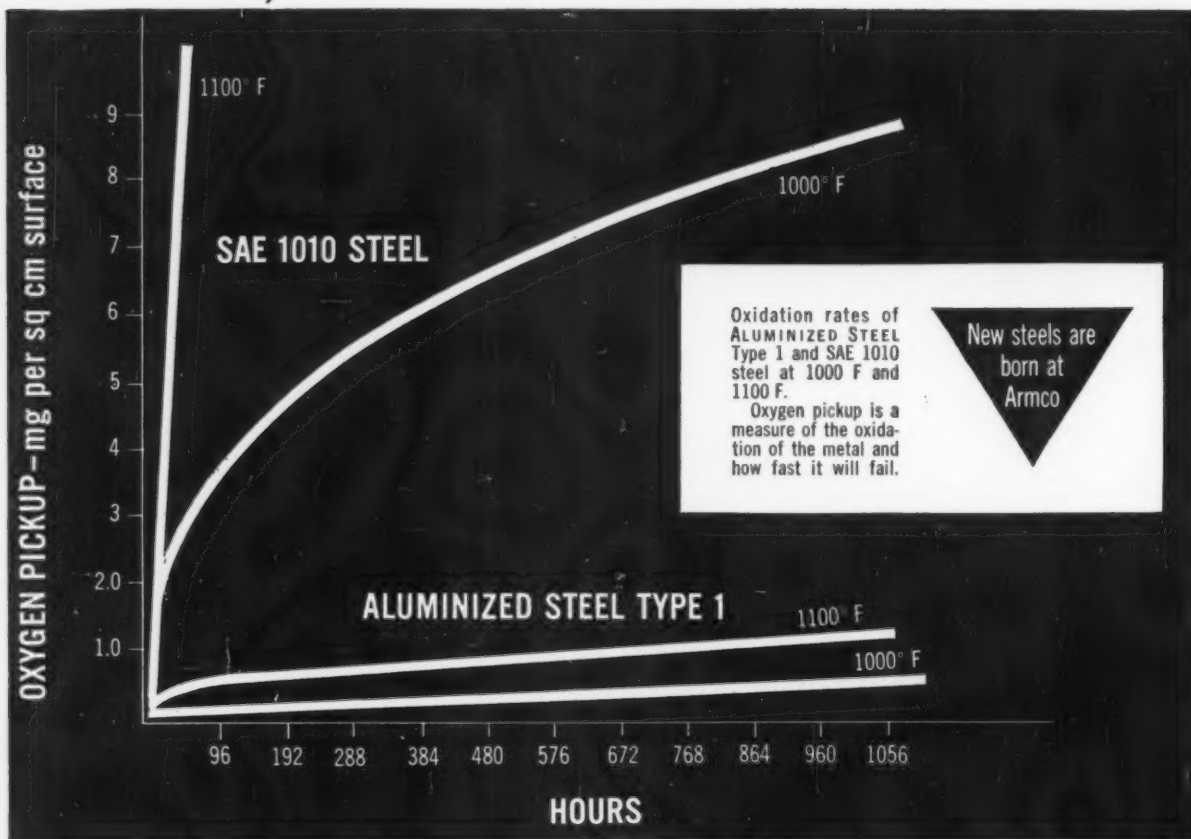
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## Research Data Shows Why Armco's Special Aluminum-Coated Steel Withstands Heat

Comparative oxidation rates indicate remarkable durability of corrosion-resistant Armco ALUMINIZED STEEL Type 1 at high temperatures.

Oxidation rates of ALUMINIZED STEEL Type 1 at 1000 and 1100 F compared with those of SAE 1010 steel demonstrate why this special Armco Steel has become a popular material for parts that must resist heat.

The hot-dip aluminum coating applied by a special Armco-developed process prevents oxygen from destructively scaling the base metal at temperatures up to about 1250 F. In addition, ALUMINIZED STEEL also provides good corrosion resistance. This unique combination of steel and aluminum withstands the corrosive attack of combustion products and condensates.

Because ALUMINIZED STEEL Type 1 combats both heat

and corrosion and because its steel base gives parts high strength, it can be used in thinner gages and at higher temperatures than other metals.

For these reasons, Armco's special aluminum-coated steel has proved to be the most economical and durable metal for auto mufflers, heat exchangers, combustion chambers, industrial ovens, appliances, and similar products requiring resistance to heat and corrosion. Put the cost-cutting, performance-improving advantages of Armco ALUMINIZED STEEL Type 1 to work in your products. Write us for complete information. Armco Steel Corporation, 3249 Curtis Street, Middletown, Ohio.

## ARMCO STEEL



Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation



# Unsung Supporters In the Tough Steel Stand

Industrial history has been made by the steel industry stand in stemming inflation, slowing up big wage hikes, and holding the price line. No matter what happens, these issues have been pointed up for all to understand.

The union will have tough sledding to ever again get outlandish wage-fringe concessions. In the end—whenever that will be—both sides will gain from the current bare-knuckle hassle.

But while both sides are bloody with unexpected discoveries about each other, let's turn to the sidelines. Just who helped the steel industry to put up such a show of determination? The list is not small, by a long shot.

Steel customers all over the nation piled up steel before the strike on July 15. They did this mostly for the basic reason of support. In the past, customers with depleted stocks helped write the steel contracts by demanding an end to the tieup. This time it was different.

Almost to a customer—and down to the last ton in the barrel—steel users sided with the industry. Did it cost them anything? It sure did. Some carmakers lost to competition. Same for appliance makers. Stampers saw their business fall off. Much of this will not be retrieved.

Customers knew if the wage-fringe package was another lulu, there would be another price increase. They have had it on that score. They knew, too, that if steel were to be knocked off, they would be next on the same pattern. They held—and lost business. The strike lasted longer than they thought, so inventory levels were ragged and unbalanced.

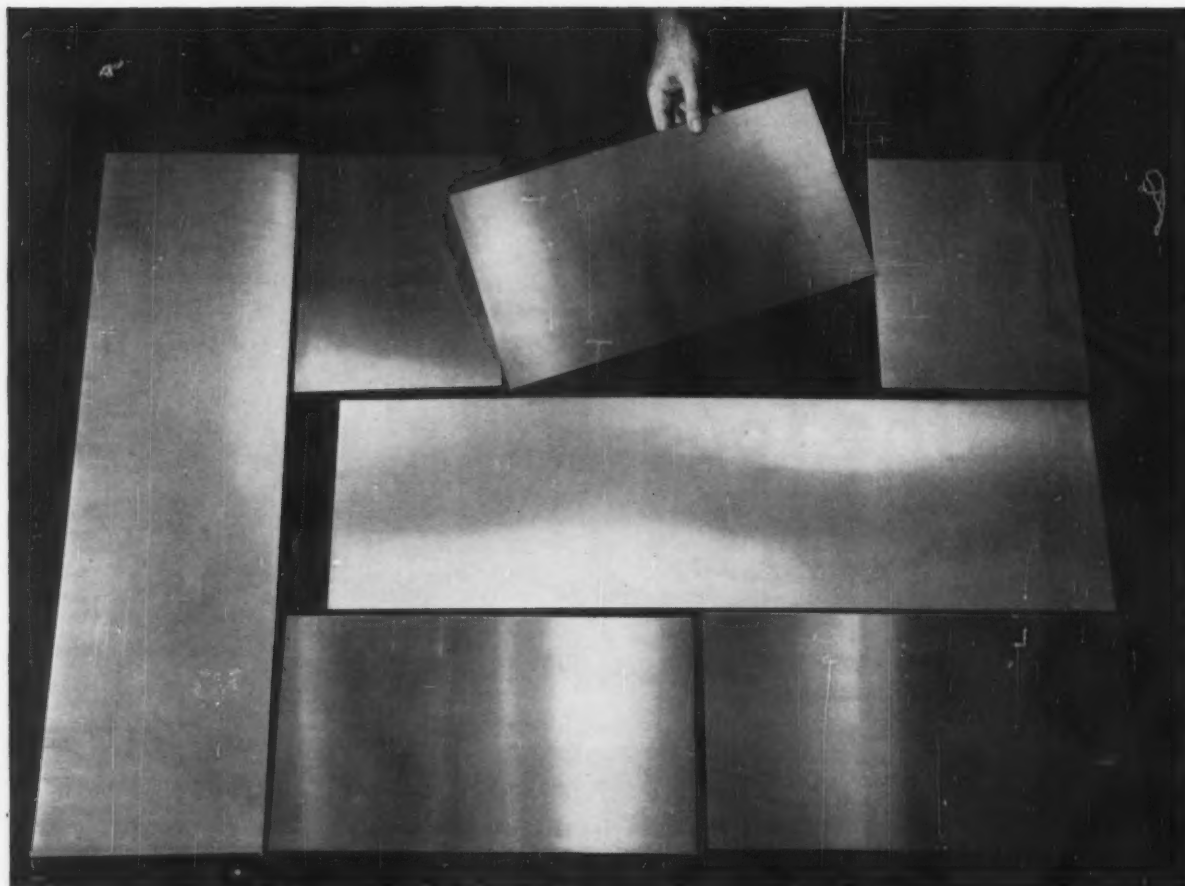
But there are other unsung supporters. Railroads lost millions due to the strike. Railroad workers helped pay the price of support because many were laid off. The same for truckers. The same for 300 thousand other workers who were affected by the steel walkout.

The U. S. Treasury is without millions today because of the strike. If taxes are not made up, we will have a bigger deficit. More borrowing may be necessary at high interest rates. So the taxpayer has a stake in the steel industry's fight against inflation and future inflationary wage-price increases.

The steel industry is the first to acknowledge it could not do the job alone. It was wise to sense the temper of the times and take its stand. Now we will soon find how much was—or wasn't—in vain.

*Tom Campbell*

Editor-in-Chief



## How many sheets could you make from today's waste aluminum?

If you tend to shrug off scrap as an unavoidable business loss, here's a plan that can change your thinking. It's the Ryerson Aluminum Sheet Plan that makes exact lengths and widths available to most users—generally on a *net weight basis*.

Under this plan, you order the exact sizes you need for your production runs—and Ryerson produces them quickly from coil stock on the most modern and accurate slitters and cut-to-length lines. You thus avoid buying metal that you cannot use . . . save the time and labor of

processing within your own plant. And in addition, Ryerson can schedule deliveries to match your production pace, enabling you to convert storage space to more productive use and release capital tied up in inventories.

Here you'll find the widest selection of alloys, tempers and thicknesses plus expert technical help on selection and fabrication problems. So ask your Ryerson representative to review your production requirements with you and show you how to eliminate your scrap problems immediately.



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## More Computers to Come

Steel industry interest in computers is surprising even builders of computers. Another steel finishing mill is scheduled to go on full computer control next year. At the same time, the computer will make its first appearance in the steel service center industry when a switch to full computer controlled order systems will begin.

## New Ultra-Strength Steels

The coming year can be expected to see major development announcements of ultra strength steels developed specifically for military use. They will have tensile strengths in excess of 250,000 psi at elevated temperatures.

## Do-it-Yourself Packaging

Low-cost materials and simple techniques will make it possible for more manufacturers to mold their own foamed-in-place polyurethane cushioning for packaging delicate items. Another advantage: Storing polyurethane takes up much less room than fabricated packaging materials such as curled hair. The U.S.A.F. report also discusses the chemistry of foam reactions and the effects on metals.

## Molybdenum for Space Use

Sheet and "sandwich" structures of molybdenum are rapidly nearing sizes which will actually be needed for testing on future, manned space vehicles. Prototype aerodynamic structures, hoped to withstand anticipated 3000°F temperatures, are already being fabricated.

## Prevents Scale Formation

Look for greater parts protection in heat treating units this coming year. For example, a new injection for warding off decarburization and scale formation will be available. It's designed primarily for luminous wall-type furnaces. Auto-

matically injected during the high heat phase, it burns up excess oxygen and balances combustion products. Technique is used for steels from 0.20-1.00 pct carbon content.

## Bores with Tape Controls

In machining parts for missile use, a new tape-controlled jig borer does more than just control the table and saddle locations, spindle feeds and speeds. This unit also controls the depth of the bore. The result is a 50 pct reduction in manufacturing time, as compared to the same machining operations being run on conventional type equipment.

## Cars to Keep Shrinking?

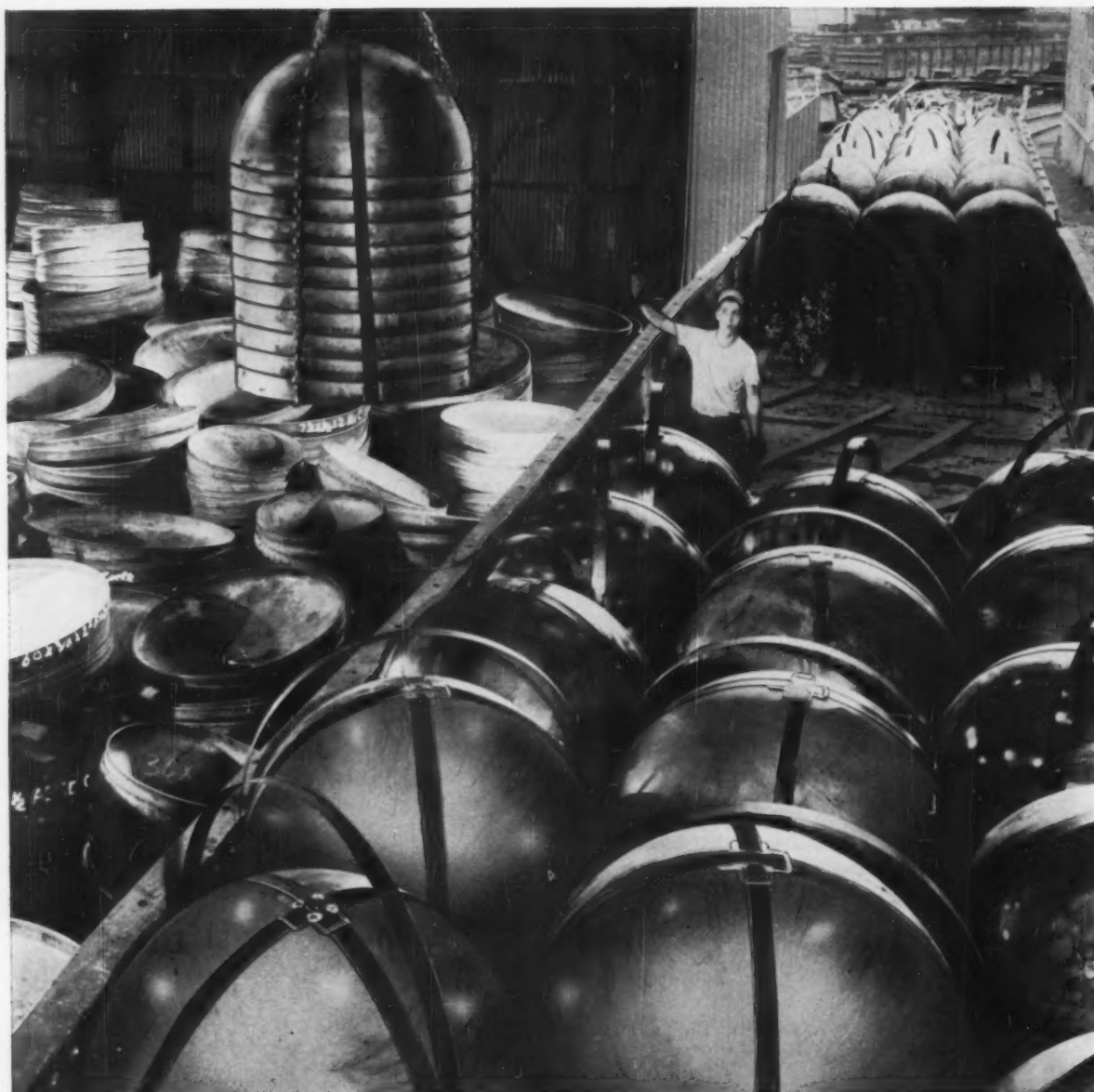
Will U. S. cars continue to shrink in size? Current Detroit rumor is they will. Ford reportedly is thinking along Volkswagen lines—a rear engine car with a wheelbase less than 100 in. (Falcon's wheelbase is 109.5 in.) A rear engine would mean an air-cooled aluminum powerplant is on the horizon.

## Make Large Tantalum Sheet

Tantalum will be in greater demand in 1960. One reason is that fabrication problems are being solved. Large sheets of this highly-resistant metal will be turned out by a newly perfected process. The large sheet will eliminate the need for complex welding of smaller sheets into chemical reaction vessels.

## Better Ultrasonic Cleaning

Introduction of a new device, called the trinisitor, will trim weight of ultrasonic generators by as much as 80 pct and the size by about 50 pct. The trinisitor is a thimble-sized solid state device which will replace the last remaining vacuum tube in the generator. Developers claim that the new device will lead to improvements in both performance and reliability in the cleaning of industrial items.



## Get fast delivery—order **COMMERCIAL** heads

COMMERCIAL tank heads, cold formed in steel dies, are more accurate than spun heads, yet actually cost you less. That's because their consistent uniformity makes fitting-up easier...welding faster. And, you get this advantage in every size and style—in fact, in every single head...just one or a whole carload.

For fast delivery, COMMERCIAL offers heads from stock made with a complete range of solid dies in all standard sizes from 12" to 72" O.D....in all popular gauges up to ½" thickness. Heads can be furnished for code or non-code pressure vessel construction from steels to meet the required specifications. Types fur-

nished include flanged-and-dished, ellipsoidal, hemispherical, flanged only, double dished and obround.

With over 30 years experience and ingenuity in cold forming of steel, COMMERCIAL produces heads with improved metal quality in presses up to 2000-ton capacity. Three plants—Youngstown, Chicago, Salt Lake City—strategically located in important steel producing centers, are keyed to expedite your order.

For full information on heads in stock for immediate delivery, write to Commercial Shearing & Stamping Company, Dept. K-53, Youngstown 1, Ohio.

Specialists in the shape of things to come

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## LETTERS FROM READERS

### From Cuba

**Sir**—Although rather late, I had the good fortune to come across your Oct. 1 editorial on the steel strike. I wish to emphasize it is precisely the most opportune admonishment to all steelmakers in the states, extending in particular to the labor union leader who also cannot safely ignore or minimize the importance of perils involved in the prevailing foreign steel competition.

Since my suggestions late last June, I have been keeping tabs on the haggling debates between management and labor. Neither has scored a decided success, while foreign steel producers are reaping the benefit effecting substantial shipments to all overseas markets including your own.

**Left Out**—For quite a long time, the finished products from American mills have been virtually excluded from jobbers' warehouses in these Latin American countries, and not by the shortage of the recent record-breaking strike, but as the result of non-competitive prices.

It would be advisable for those who seemed to disregard your warnings, to send down a "go-getter" salesman to try to sell the jobbers here steel items such as: Pipe, sheet, plate, merchant and reinforcing bars, wire products, etc., at prevailing prices from American mills. He will soon find out his effort goes for naught, because of the fact of much higher prices which prohibits buyers to book tonnage.

**Commercial War**—As this writer views the situation, there is no question that a commercial war is in the offing. All industrial countries of the world will be entangled, regardless of political affiliations.

The United States should be on the alert, and most emphatically

relax on its Good Samaritan policy and proceed to take immediate action, exerting every possible effort to reconquer its old, built-up trade, abandoned to foreign competitors. —R. C. Riera, Havana, Cuba.

### Depreciation

**Sir**—I would appreciate receiving two reprints of your special report to management on the need for depreciation reform.

This office is a subscriber to The IRON AGE and we have found the magazine to be interesting as well as informative.—Susumu Okamoto, Commercial Section, Consulate General of Japan, San Francisco, Calif.

**Sir**—I would appreciate your sending me 10 copies of the article "Industry Survey Points Up Need For Depreciation Reform."

Since you are continuing this subject, and particularly with respect to a full report of the depreciation hearings before the House Ways and Means Committee, I would appreciate your sending me ten reprints of same providing they will be available also. — W. A. Renz, American Railway Car Institute, New York.

■ Reprints have been sent.—Ed.

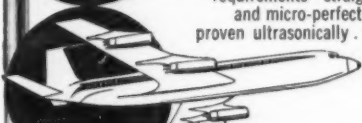


## Let TMI "Draw-In" the Answers

To Your Tubing Problems



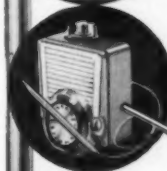
“Stainless Steel AVIATION tubing drawn to 'Mach-3' tolerances, tempers, and test requirements—straight and micro-perfect—proven ultrasonically...”



“Miles and miles of special NUCLEAR Alloy tubing drawn so smooth and so accurate that electronic audio-visual oscilloscope testers give it an unqualified O.K.”



“Precious inches of MEDICAL tubing drawn to life-saving specifications for brain fluid drainage and "optic" operations... eyeball jacks, and other applications of equal medical posture.”



“High Quality INSTRUMENTATION tubing that matches the modern thinking of the best in control engineers.”

**We have the kind of men, equipment and drawing experience to do the "impossible" for you, too! Try TMI!**

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100 Tons	$\frac{1}{4}$ "	x 84"	x 240"
100 Tons	$\frac{1}{4}$ "	x 84"	x 360"
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81 Tons	$\frac{3}{4}$ "	x 96"	x 360"
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100 NT	$\frac{1}{4}$ "	x 72"	x 240"
100 NT	$\frac{3}{4}$ "	x 72"	x 240"
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### The Barber Poll

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Harry Rich operates a tonsorial parlor in the nation's capital and is a firm believer in the adage that men tell their barbers things they wouldn't tell anyone else. Using this line of thinking, Mr. Rich has predicted the outcome of a presidential election incorrectly only once since 1928. That once came when a chap named Harry Truman fooled him and several others.

**Expanding**—How does he get his accuracy? He sends out questionnaires to 15,000 barbers across the nation. This way he finds out what the male population is thinking across the country.

It is rumored that he is planning to expand into the beauty parlor area. This ought to give a well-rounded opinion to what's going on.

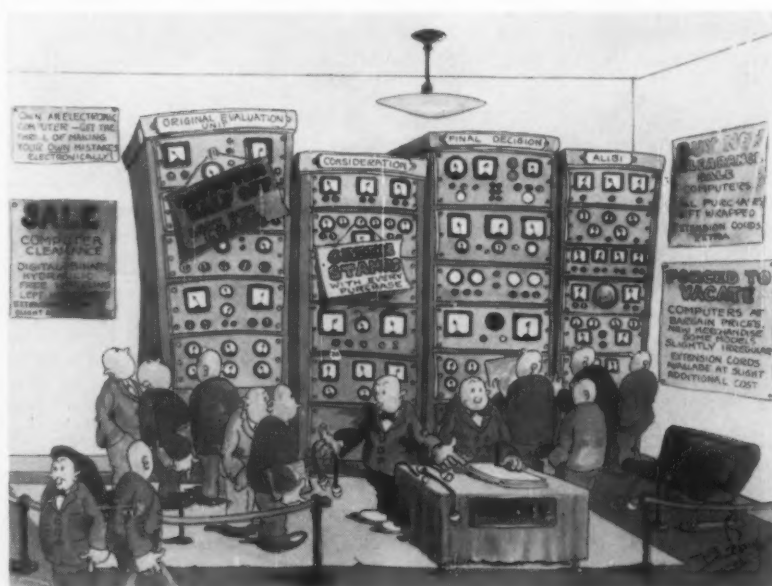
So, if you're dissatisfied with your present manipulators of the ouija board, why not give Mr. Rich a call. But if it's only a local market survey or other pertinent information related to your immediate area, we suggest you drop in on your barber and listen to the conversations. They may give you the answers you need.

### Monthly Spoof

Want a good laugh each month? Hang up the 1960 Minneapolis-Honeywell calendar in your office and it should do the trick.

Again this year the calendar, distributed by the firm's Philadelphia-based Brown Instrument Div., spoofs the company's customers and itself. Each month of the year has a cartoon by artist Bill Eddy. And, they are pretty good ones. (See below).

The company has distributed 80,000 of the multi-colored date pieces throughout the world.



**LAUGH A MONTH:** "Only the Computer knows how we can quote these prices." This is one of the 12 monthly cartoons decorating the 1960 Minneapolis-Honeywell calendar. Others deal with satellites, atomic fall-outs, engineering planning and the state of some businesses.

## COMING EXHIBITS

**Plant Maintenance & Engineering Show** — Jan. 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

**Tool Show**—April 21-28, Detroit Artillery Armory, Detroit. (American Society of Tool Engineers, 10700 Puritan, Detroit 38.)

**Welding Show**—April 25-29, Great Western Exhibit Center, Los Angeles. (American Welding Society, Inc., 33 West 39th St., New York 18.)

**Southwestern Metal Show** — May 9-13, State Fair Park, Automobile Bldg., Dallas, Texas. (American Society for Metals, Metals Park, Novelty, O.)

**Design Engineering Show** — May 23-26, Coliseum, New York. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

**Production Engineering Show**—Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

**Machine Tool Show** — Sept. 6-16, International Amphitheatre, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

## MEETINGS

### JANUARY

**Institute of Scrap Iron & Steel, Inc.**—Annual convention, Jan. 10-13, Fontainebleau Hotel, Miami Beach, Fla. Institute headquarters, 1729 H St., N. W., Washington, D. C.

**Society of Plastics Engineers, Inc.**—Annual technical conference, Jan. 12-15, Conrad Hilton Hotel, Chicago. Society headquarters, 65 Prospect St., Stamford, Conn.

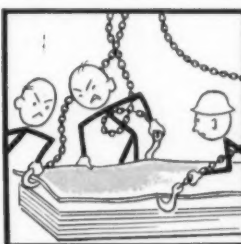
**Society of Automotive Engineers, Inc.**—Annual meeting, Jan. 12-16, The Sheraton-Cadillac and Statler Hotels, Detroit. Society headquarters, 485 Lexington Ave., New York.

**Industrial Heating Equipment, Assn., Inc.**—Annual winter meeting, Jan. 18-19, Warwick Hotel, Philadelphia. Association headquarters, 1145 19th St., N. W., Washington.

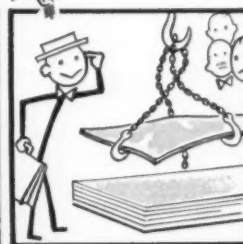
**Steel Shipping Container Institute, Inc.**—Winter meeting, Jan. 19-20, St. Regis Hotel, New York. Institute headquarters, 600 Fifth Ave., New York.

**Steel Plate Fabricators Assn.**—Annual meeting, Jan. 21-22, Roosevelt Hotel, New Orleans, La. Association headquarters, 105 W. Madison St., Chicago.

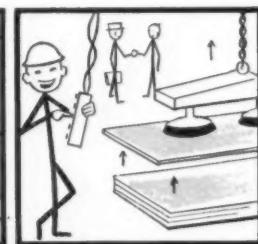
## VAC-U-LIFT VAN Solves another Material Handling Problem!



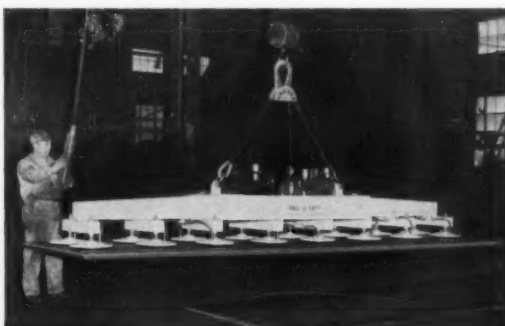
**1** A group of the hardworking boys were lifting steel plate—a real bottleneck and backbreaking job that hasn't changed for years . . . but then . . .



**2** Along came VAC-U-LIFT VAN — Of course this problem was a natural since he had helped a lot of other industries with this same problem.



**3** Back from the plant with a speedy quote . . . quick delivery of a unit, VAC-U-LIFT VAN has made a new group of friends.



### VACUUM STEEL PLATE HANDLER

Prior to installation of the vacuum plate handler, the same operation required 3 men for operation of the crane and attaching chains. The Vac-U-Lift unit shown in photograph requires only one man for complete operation which means faster, safer and more economical steel plate handling. This unit lifts and conveys over 4½ tons of steel plate and is adaptable for use with overhead traveling crane, boom crane and stiff-leg crane.

Your problem may not be illustrated here, but if you do have a handling problem, Vac-U-Lift's experience and engineering know-how, through the expert use of vacuum, can help you. Vac-U-Lift systems are currently being used to control, position, and maneuver a multitude of materials weighing from 20 tons down to a few ounces.

All Vac-U-Lift units carry a full 3 month unconditional warranty.



Send Today  
For FREE  
Illustrated  
Brochure

This brochure shows some of the many VAC-U-LIFT systems now in use. It explains how VAC-U-LIFT works and how you can take advantage of VAC-U-LIFT'S 3-step analysis service without cost or obligation, write  
**DEPT. VL-92, VAC-U-LIFT CO., Salem, Illinois**  
Division of the Siegler Corporation



## THE OTHER TURN



The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

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AS 1959 FADES INTO 1960, all thoughts turn to the business outlook for the coming year. One reputable forecast is the National Industrial Conference Board's Economic Forum. Some predictions:

GROSS NATIONAL PRODUCT, currently at the rate of \$480 to \$485 billion, will jump about 5 pct to about \$505 billion by mid-year. Equally significant, the GNP should continue the rise in the second half, but at a lower rate. The consumer price index will hold relatively steady, and rise about only one percentage point. The year will be characterized by greater employment, with year-end unemployment at about 3.1 million.

INDUSTRIAL EXPANSION IN WEST EUROPE is viewed with mixed emotions by most U. S. businessmen. One factor is the "coming of age" of the European steel industry. This is characterized by new production facilities aimed at high quality products. Another point is a new market philosophy patterned after the American system of price stability and consistent service.

MOST POTENTIAL BUYERS OF DURABLE GOODS are in pretty good financial shape for 1960, but savings have been higher. Although personal income is at a record high, increased consumer expenditures and a trend to go further into debt has put savings about 10 pct under the rate of 1957 and even two pct under 1958, according to the Securities and Exchange Commission.

TOOL AND DIEMAKERS EXPECT THEIR 1960 volume of business to hit the level of 1957. This will complete the recovery phase from the recession of 1958 which hit the tool and die industry hard. George S. Eaton, executive vice president of the National Tool & Die Manufacturers Assn., expects output to be about 15 pct higher than the past year.

NEW COPPER USES CAN BE EXPECTED from a joint effort by major copper producers to conduct research and studies for expansion of uses of copper. The six major producers have formed a Copper Products Development Assn. for that specific purpose.

LOOK FOR A REVISION OF THE FRB INDEX of Industrial Production to be announced any day now. The change will make the indicator more sensitive, take into account new products and developments in the economy. Best guess is that revised figures will top figures on the old base by ten points.



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Manufacturers  
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Manufacturers of a wide variety of products find Bridgeport Free Machining Brass Rod eminently suited to their items—from both a production and beauty point of view. Furniture manufacturers are but one successful example.

The production steps involved in manufacturing such furniture are frequently numerous and complex. For example, a solid brass tea cart such as shown here may represent some ten or more separate production steps. These include cutting, bending, drilling, tapping, twisting, polishing and lacquering, most of which are done on high-speed automatic equipment. The objective here, as with any screw machine operation, is high *uninter-*

*rupted* speeds. An increasing number of manufacturers are achieving these uninterrupted speeds with Bridgeport rod and tubing of various shapes and sizes. They find, on a comparative basis, that the high quality of Bridgeport Free Machining Brass is *constant* and can be depended on from end to end.

Bridgeport Free Machining Brass is but one of the many "easy-does-it" metals that are standard stock and immediately available from nearby Bridgeport Warehouses. An inquiry to your local Bridgeport Sales Office may lead to improving your product, increasing your production rate and raising your profits. Call today!



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# World Steelmaking Heads Into An Era of Major Change

**The new European steel industry is leap-frogging from the Bessemer generation to the most modern methods.**

**Marketing policies are also shifting more in line with U. S. methods.—By G. J. McManus.**

■ The world steel map is going through an era of marked change.

Possibly not since the rise of the U. S. as a manufacturing nation has there been a comparable period of shifting of the balance of power in steel production.

**The Factors**—The era of change is characterized by three major factors:

1. The coming of age of the steel industry of Western Europe in

steelmaking technology and product balance.

2. Changes in European marketing and sales concepts to more closely parallel those of the U. S.

3. The continued rise of the USSR as a force in world steel production.

Of equal importance is the concurrent change in pattern of world steel use. Here again, it is not only change in total steel use, but in shift in product.

**Markets Also Grow**—And the growth in foreign steel is accompanied by overall industrial growth abroad. In fact, the new steel push may signal the opening up of a giant market for all American industry.

It could also mean massive com-

petition. The question is whether foreign industry can absorb added steel provided by foreign mills.

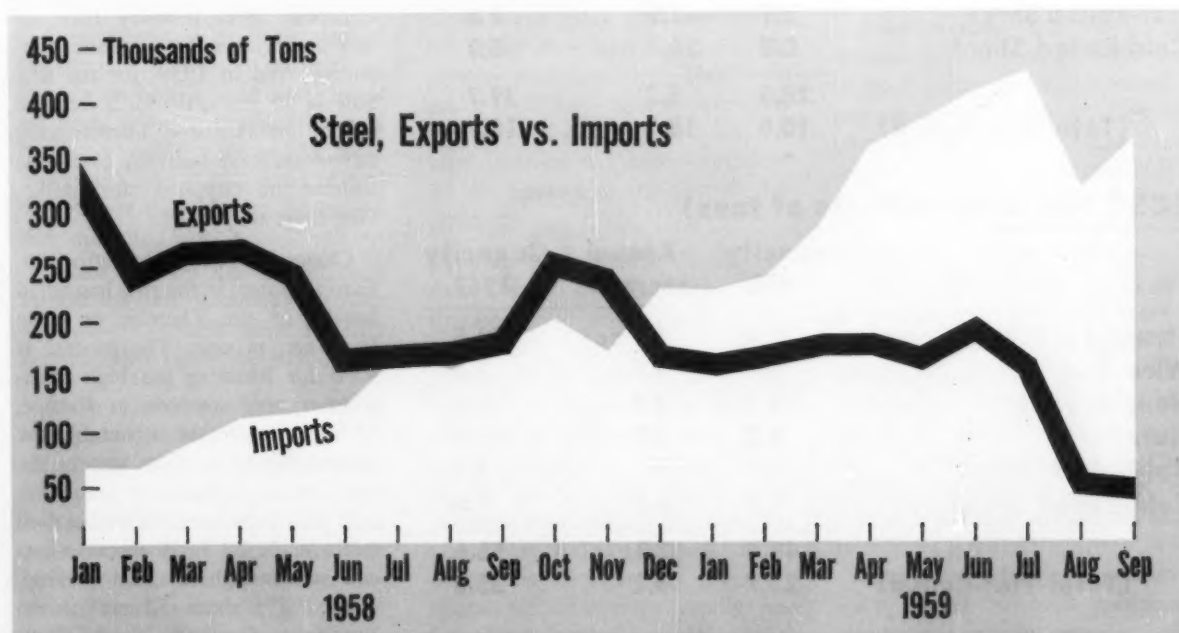
Current expansion projects will leave a hefty chunk of steel to be absorbed. Western Europe has steelmaking capacity of about 100 million tons in 1957. By next year, capacity will be 124 million tons. Peak steel production for Japan was 13.8 million tons in 1957. The country is planning for 20 million tons of capacity by 1962.

**What's Going On**—Specifically, here's what's happening around the world in steel:

1. A rash of new cold-rolling mills are coming up for Europe and Japan.

2. New basic oxygen steelmaking

## U. S. Steel Exports Drop, Imports Climb



vessels will boost foreign capacity.

3. Foreign mills are starting to act and think along the lines of tonnage production for mass markets.

4. Foreign suppliers of seamless pipe and many other products are reacting to the current pinch with new price restraint and new dependability.

This, then, is the new challenge for American steel. Foreign mills are equipping themselves to go after the cream of the steel market. They are out to supply the low-carbon, cold-worked steel needed for mass production.

**Russian Threat**—And behind the Iron Curtain, the Russian buildup of steelmaking facilities continues.

Although U. S. steel production gained some 7 million tons in 1959 over 1958, the U. S. percentage of total steel remained at 28 pct of the world total.

The Soviet bloc's pct of world steel production remained at 30 pct while the USSR itself held to about 20 pct.

Actually, these figures tend to be misleading because only the resurgence of steel demand in the West permitted the condition in a share of world total production to remain the same.

**Opposite Goals** — In Russia, where there is not nearly enough steel to satisfy demands, steel production gains are virtually the same as capacity gains. In the Western

nations, tonnage changes reflect changes in demand.

Had the steel strike not paralyzed the U. S. steel industry for much of 1959, the U. S. share of world steel production could have shown a gain in spite of added Russian capacity.

**The Figures** — For comparison, here are the figures:

In 1958, the U. S. produced 85 million tons of steel. This year the total is about 92 million. In 1958, Russia produced about 60.5 million tons. This year the total will be about 65 million tons.

The entire Soviet bloc this year will produce some 99 million tons, or substantially more than the U. S. steel industry poured.

For the moment, the Russian steel industry poses little threat to the U. S. steel industry, or, for that matter, the entire Western steel industry. Demand for steel at home continues well ahead of the USSR's most ambitious expansion plans.

**Dumping a Threat** — However, dumping of steel for political reasons is always a threat. And the industry's gains in Russia eventually will put the Soviet bloc into the world market picture as a major force.

In the face of rising steel imports to the U. S., the changes in the European steel industry take on new importance to domestic producers. And in 1959, for the first time in 56 years, the U. S. became a steel import nation. Furthermore, this would have been the case even without the crippling steel strike. (See chart on p. 17.)

**Changes Coming**—In retrospect, European steel in the past has relied heavily on the Thomas, or basic Bessemer, process. The process is good for handling the high phosphorous ores common in Europe. It makes steel that is suitable for reinforcing bars, light structurals, and similar products.

It is not designed for low-carbon steels, made for fussy specifications and soft enough for cold-working.

In 1957, about 50 pct of the European Coal & Steel Com-

## European Steel Emphasis Shifts

### ECSC Production (millions of tons)

	Production 1952	Annual Increase	Production 1958
Structural & Tube Rounds	15.2	2.4 pct	17.5
Wire Rod	2.8	6.6	4.1
Hoop & Strip	2.3	5.8	3.2
Plate	4.3	9.0	7.2
Hot-Rolled Sheet	3.1	-2.9	2.6
Cold-Rolled Sheet	0.8	36.1	5.1
	28.5	5.7	39.7
(Total Flat-Rolled)	10.5	18.1	18.1

### ECSC Finishing (millions of tons)

	Capacity 1958	Annual Increase	Capacity 1962
Structural & Tube Rounds	22.4	3.4 pct	24.5
Wire Rod	5.1	1.9	5.5
Hoop & Strip	3.2	2.8	5.0
Plate	9.3	3.1	10.5
Hot-Rolled Sheet	3.1	0	3.1
Cold-Rolled Sheet	5.9	4.5	7.0
	49.0	3.1	55.6
(Total Flat-Rolled)	22.7	3.2	25.6



munity's capacity was in Thomas vessels. The same process represented 35 pct of capacity for all Western Europe.

**Product Mix**—The limitations imposed by steelmaking methods showed up in product mix. In 1957, ECSC countries had over 50 pct of their shipments in light sections, heavy sections, wire rod and permanent way material. Current export figures show the same pattern. Over half of the steel coming into this country is in the form of bars, shapes, and rods.

Europe is now swinging away from this unbalanced product mix and the timing has coincided neatly with development of the basic oxygen steelmaking process. Oxygen vessels offer a low-cost method of making low-carbon and other steels in tonnage quantities. In effect, some say, they enable the foreign mill to leap-frog over the open-hearth, going directly from Bessemer steel to the most modern methods.

**Units Installed**—Statistics show some of the impact of oxygen steelmaking. By the end of this year, world capacity of the LD type vessels will top 14 million tons, with 6 million of it in the U. S. and Canada. Kaldo vessels could add another million tons in 1960.

One interesting point is size of the vessels. European steelmaking has always been geared along modest lines, with the average Thomas converter running about 25 tons. The new Kaldo vessels will run 110 tons, about the same as the largest now operating here.

Japan is also moving strongly toward oxygen steelmaking. Four LD oxygen vessels were recently installed. Six more are coming up.

**More Finishing**—The trend in foreign steelmaking applies to finishing as well as melting. One five-stand cold mill has just been ordered for Holland. Two cold mills have been ordered for Japan. One is being erected in Germany. Another French cold-mill is to rival any in up-to-date design.



**USSR LOOKS AHEAD:** Typical of Russian steelmaking advances is this model of a new mill displayed this year at the Soviet Exposition.

One equipment man says seven new cold mills will be ordered for Europe by the first quarter of 1960.

All these mills will be able to fill needs that have been met in part by American steel. Nearly 30 pct of U. S. steel exports were sheet and strip. Another 16 pct was tinplate. Europe has been dependent on this country to some extent for sheet.

**Future Possibilities**—It may be that new industrial expansion in Europe will leave foreign steel with an added sheet deficit. Recent growth rates indicate this could happen; for example, the gains in auto production and other consumer products in Europe.

The situation in oil country seamless may indicate the direction all foreign steel is taking. Seamless production is inherently a quality operation and foreign supply has been on a relatively stable footing.

However, foreign pipe mills cut prices in 1954 and jacked up prices when things got tight in 1956.

**Price Policies**—But the current squeeze has not seen the same kind of price manipulation, according to one major oil producer. Pipe has come through on schedule, with delivered prices in Venezuela still 3 to 5 pct under prices of American pipe.

There has not been enough time to really test the new philosophy of foreign pipe mills and there is no certainty that all foreign producers will get religion.

However, there are moves in that direction. Some foreign producers have frankly admitted superiority of the "American system" of adjusting production to demand while stabilizing prices.

Generally, European producers have tended to hold production steady while cutting prices.

# Planemaker Learns to Cut Costs

## But the Lessons Can Be Applied by Others

**Much can be learned from defense industries, but seldom does it have anything to do with cost-cutting.**

**However, Republic Aviation Corp. has started a program that can be adopted profitably by other metalworking companies.—By G. G. Carr.**

■ Metalworkers are accustomed to learning from defense industries. But they rarely look there for ways to cut costs. Military hardware comes high, and quality must be put before economy. But an intensive cost-cutting program by Re-

public Aviation Corp. and its suppliers provides valuable leads for all manufacturing.

In 8 months the program has saved over \$25 million in production costs on the F-105 fighter-bomber (see photo). It is expected to better this record by an additional 10 pct. Believed to be unique in defense industries, the campaign has already slashed 19.9 pct off total costs of the plane, with an ultimate target of 30 pct.

**Everyone Does It**—The program, conceived by Republic as prime contractor for the \$2.5 million plane, has been carried forward to its major contractors and in turn

to their subcontractors and suppliers. As a result, more than 831 companies are involved. Greatest emphasis has been on the 93 firms which account for 60 pct of the "fly-away" costs of the F-105.

Republic emphasizes that its program is not just another cost-cutting drive. Nor is it a "meat-ax" operation. And the results do not imply over-charges, inefficiency or poor design. Instead, the savings have come through careful appraisal of the design, function and manufacture of thousands of individual parts.

**Great but Costly** — Results are all the more remarkable when it is realized that the very existence of the plane embodies countless technological marvels. "It's a wonder that it flies at all, much less that the price can be cut," comments one observer.

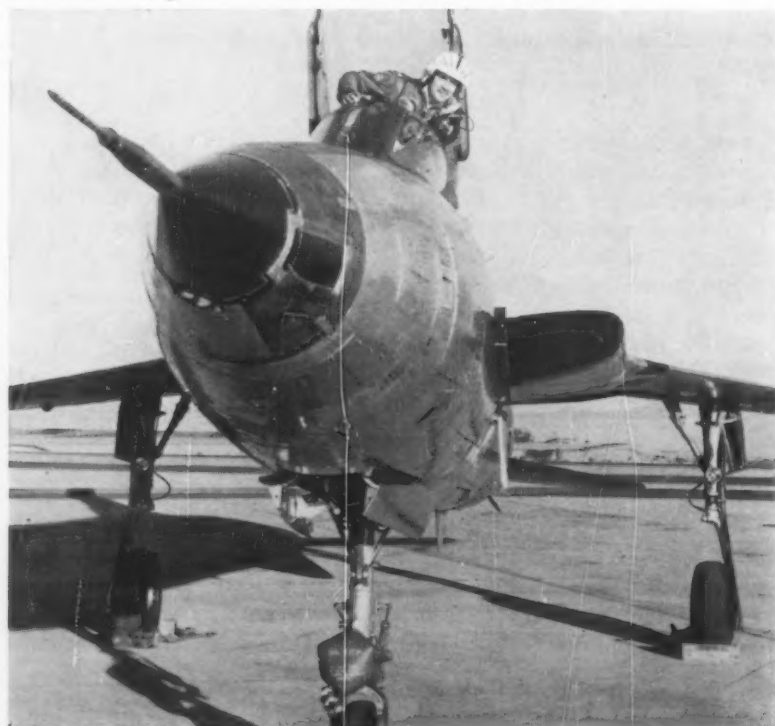
Impetus for the program came when Air Force told Republic that it considers the F-105 a truly great airplane, but just too expensive for continued purchase. Not that the price is unnecessarily high, but rather that appropriations just aren't running big enough.

**Nearing the Target** — With this spur, Republic set a cost reduction target of 30 pct, of which 19.9 pct has been reached. In addition to searching cost control in Republic's own plants, the program was directed to specific off-site areas: Raw materials, subcontracting, purchased equipment, electronics, and government furnished equipment (GFAE).

E. I. Little, Director of Material for Republic, cited these results:

In subcontracting, which covers material designed by Republic but purchased from vendors, the program had saved almost \$2.5 million or 15.5 pct. In equipment (purchased assemblies) costs have come down 12.9 pct or more than \$3.5

## Jet Sets New World Speed Mark



**SPEED MERCHANT:** Cutting production costs didn't cut down on the speed of Republic's F-105 fighter-bomber. Brig. Gen. J. H. Moore set a new unofficial world speed record of 1216 mph with this plane earlier this month at Edwards Air Force Base, Calif.

million. Electronics gear shows a 21.5 pct saving or over \$3 million while raw materials savings total \$9.5 million or some 16.6 pct. In GFAE, rarely accessible to prime contractors, Republic has stimulated savings of almost \$16.5 million or 21.9 pct of quota.

**General Comments**—"We have tried throughout our program to keep squeezing and finger-pointing out of our campaign. Republic does not expect its subcontractors or suppliers to take a loss or set aside profits," Mr. Little stresses. "We ask only if the basic material and production costs can't be decreased through increases in efficiency and better cost control management."

Speaking at a conference of F-105 suppliers, Maj. Gen. Beverly H. Warren, Commander, Aeronautical Systems Center, Air Material Command, hit "unreliability, production difficulties and engineering changes as major factors causing high costs in today's weapons systems." He added that Air Force is now writing reliability requirements into its contracts.

**No Single Way** — Republic and subcontractor spokesmen stress that there is no one way to cut costs. Rather, appraisal of every step in procurement, design, and manufacturing should be appraised for possible savings.

Key areas suggested include shop and office automation, better materials handling, simpler packaging methods, value analysis of components and materials, operations analysis and a comprehensive study of all sources of supply to determine how costs could be reduced.

**Some Examples**—Illustrating how various techniques can be applied, Republic notes that stainless steel washers furnished from an exclusive supplier cost \$1.59 each. Competitive bidding dropped this price to 9¢ apiece.

Checking materials can show big savings. A bracket machined from 4130 steel cost \$18. Redesign to use two standard bushings, an aluminum tube and two 4130 stampings cut cost to \$11.55.

## Will Steel Prices Rise?

**Comments hinting at price increases have touched off wide speculation.**

**Here is an analysis of the steel price structure as it looks today.**

■ When Republic Steel Corp.'s outspoken chairman, Charles White, indicated that the present steel industry offer, if accepted, might require price increase, he opened a Pandora's Box of speculations.

Mr. White was just speaking his mind. But he started thoughts jangling all over the industry, among its customers and in union headquarters.

**Surprise to Most**—Other steel leaders were silent on Mr. White's remarks. All were caught by surprise. Some, especially among the smaller companies, were delighted. They have argued that the present steel package of 10¢ an hour without a price increase would be murder.

U. S. Steel was silent. Its board chairman, Roger M. Blough, spelled it out for newsmen months ago: A negotiated and voluntary agreement would not result in a price increase, he said. The only "out" he took for himself was to say that a mandated settlement by a government agency or body would scuttle his pledge of no price increase.

**Other Reactions**—The union is jubilant. It has maintained all along that steel companies eventually would raise prices to pay for a wage-fringe package. Now, the union takes Mr. White's statement as confirmation that it was right.

Steel users are not surprised

that the wage-fringe package will cost \$5 a ton as suggested by Mr. White. Nor are they too shocked to learn that his company cannot guarantee that no price increase will come about.

People who have followed the trend in steel are the least excited about the White comment. First: Charlie White always lets people know exactly where he stands. Second: If U. S. Steel does not raise its prices, then Republic can't make a price increase stick. That is history. There are hardly ever any successful large-scale dual price systems in steel.

**Ice Broken**—Mr. White did not say he would raise prices. He just broke the ice to say that he and his company could not say they would not raise prices.

Meanwhile, the cause of all this—the steel labor hassle—was going down to the wire with an election on the last offer. This will be followed by White House, Congressional and "other" pressures to reach a settlement.

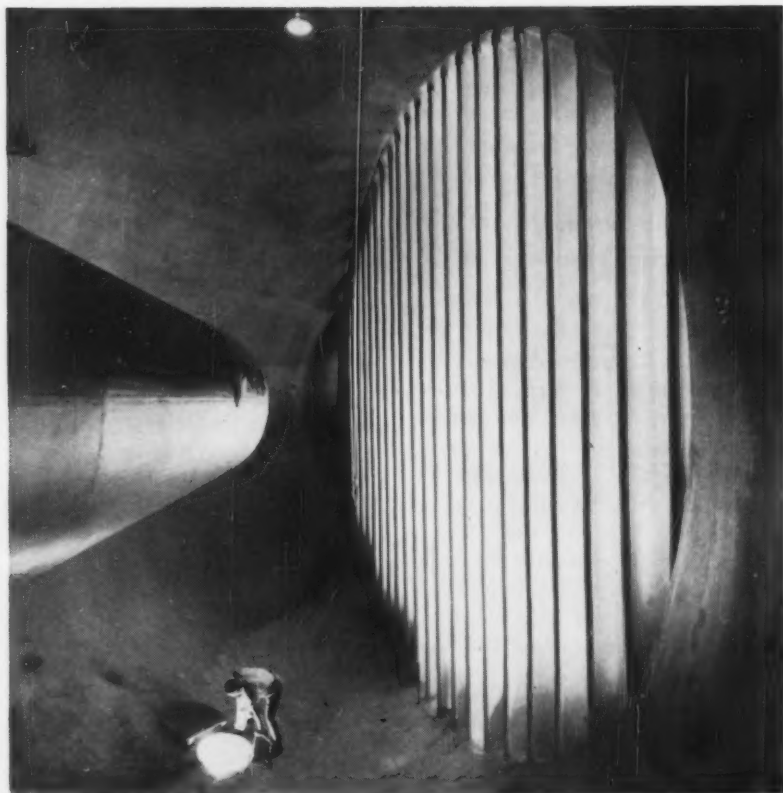
**Secret Efforts**—Several secret meetings were held recently by Mr. Blough, Dave McDonald, Vice President Nixon, and Secretary of Labor Mitchell. These have been exploratory. No definite basis for hopes for an amicable settlement have resulted so far.

When the returns of the last offer balloting are known, the Federal Mediation Service will come into the picture again. Mr. Nixon and Mr. Mitchell will put on extreme pressure at that time to get a settlement before the Taft-Hartley injunction is vacated on Jan. 26.

Odds still favor an "outside" pressure settlement—mandatory, to you.—Tom Campbell.



## Wind Tunnel Nears Completion



**BIG BLOW:** Vertical steel vanes decrease turbulence in the air flow as its direction is altered at corners of the supersonic wind tunnel at the Air Force's Arnold Engineering De-

velopment Center, Tullahoma, Tenn. When completed, the Westinghouse Electric Corp. drive system will generate wind with speeds ranging from 1000 to 3000 mph.

### Justice Dept. Steps-Up Efforts to Halt Mergers

■ Justice Department trust-busters are quietly stepping up their efforts to catch potentially illegal mergers before they're consummated.

The antitrust division, now headed by young, eager, and ambitious, Robert A. Bicks, is emphasizing preventive activities. The department hopes to avoid the long, involved legal fights to break-up mergers once companies have been fused.

**Better Liaison**—Bicks, who still carries only the title of acting head of the division, and his aides have recently been working closely with the Securities and Exchange Commission to get advance informa-

tion on mergers.

They are stepping up use of proxy and other information filed by publicly-held stock firms with the SEC. This is public and the trust-busters have always had access to it. In the past it has been used to some extent.

Now, however, antitrust division officials admit that they've got an arrangement whereby the SEC unofficially quickly sends any information it gets "that is of interest" to the antitrust division. This might amount to daily reports in some circumstances.

**Want Legislation**—Antitrust officials point out that this "more efficient" arrangement with the SEC still doesn't amount to a pre-merger notification. The information filed

by firms with SEC before a merger is far short of what the Department would get under the pre-merger notification legislation which it wants from Congress.

This measure, now pending in Congress, would give the Justice Department power to require merging firms to file detailed information with the government and then wait 90 days before merging.

### Copper Research

Six major copper producers have formed Copper Products Development Assoc., Inc., The organization was formed to conduct research and studies "for the expansion of uses of copper and copper products, and the development of new and improved copper products."

Member companies are: American Metal Climax, Inc.; American Smelting & Refining Co.; The Anaconda Co.; The International Nickel Co. of Canada, Ltd.; Kennecott Copper Corp.; and Phelps Dodge Corp. Any producer of copper is eligible for membership.

Dr. Clyde Williams, former president of the Battelle Memorial Institute of Columbus, O., has been named technical director pro tem.

The new organization does not presently intend to provide its own facilities for investigations. It will allocate research assignments to individuals, universities, and established research organizations.

### Iron Ore Probe Due?

A Senate committee may investigate imports of pig iron and other industrial commodities coming from the U.S.S.R.

A staff of the Senate Commerce Committee is now gathering facts and figures on recent imports. It is measuring the effects of low-cost imports on U. S. markets.

So far, no decision has been made as to whether or not a full scale investigation is needed. But the probers already have a sizable arsenal of facts on Red imports—should demand for public hearings arise in 1960.



# DEMAG

## CONTINUOUS STEEL-CASTING PLANTS

DEMAG  
1958

CASTING LADLE

TUNDISH  
MOULDS

SPRAY CHAMBERS

ROLLER APRON

FLAME CUTTER

BILLET TILTER

ROLLER CONVEYOR

### EIGHT-STRAND CASTING PLANT

in full operation at the Terni iron and steel works  
in Italy since 1958

Developed to the Junghans system in co-operation with Messrs.  
Mannesmann and Böhler

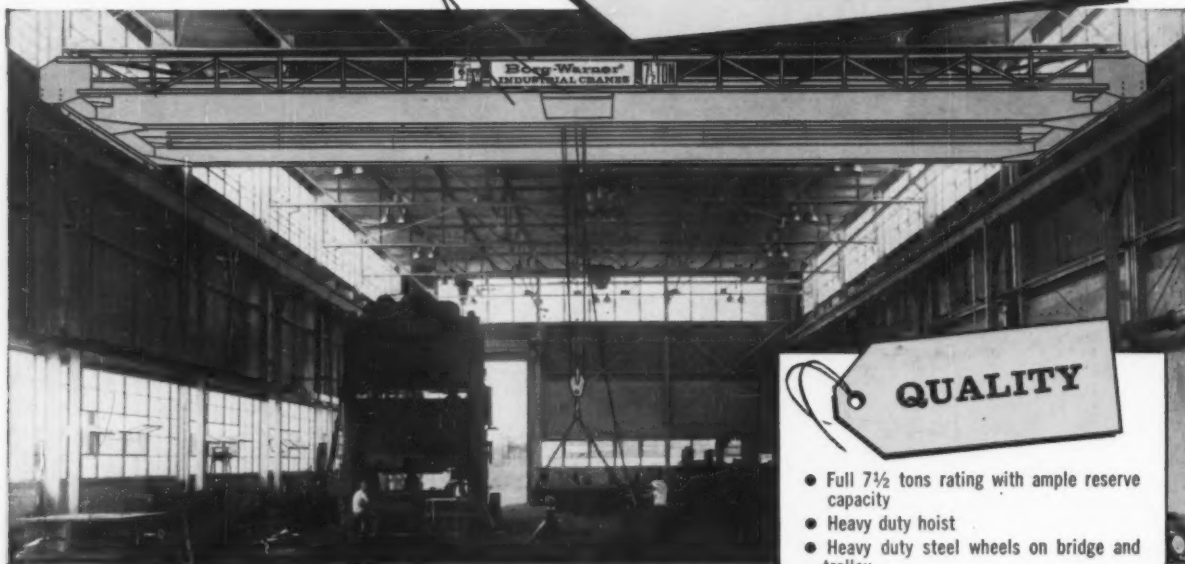
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U. S. - Representatives:  
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**Borg-Warner Industrial Cranes**  
**Quality at**  
**a price you**  
**can afford...**

**\$9900<sup>00</sup>**

For a 7½-Ton, 60 Ft. Span,  
 3 Motor, Top-Running Double Girder  
 Industrial Service Crane



**QUALITY**

- Full 7½ tons rating with ample reserve capacity
- Heavy duty hoist
- Heavy duty steel wheels on bridge and trolley
- All welded jig bored and jig assembled end trucks
- Long life precision ball and roller bearings
- Large gusset plates at end trucks
- Outrigger machinery girder construction
- Heavy duty gear reduction bridge drive
- Fluid coupled bridge and trolley drives
- Full magnetic push button control
- Magnetic bridge brake

**MODERN DESIGN**

The crane illustrated is a typical double girder installation. For shorter spans, smaller capacities and lighter or intermittent duty Borg-Warner Industrial Cranes can supply your needs at even lower prices.

## Why Borg-Warner Industrial Cranes are BETTER VALUES

Value is determined by **QUALITY** and **PRICE** . . . and, a price like this for superior Borg-Warner Industrial Cranes construction and performance assures you of top value for your materials handling investment.

If you want to boost your production and operating profits by making full use of overhead space for materials handling . . . if you can use the extra storage space an overhead crane will provide as compared with fork-truck stacking . . . if you can benefit from aisles and work areas cleared of floor-type handling equipment . . . it will pay you to consider a Borg-Warner top-running, motor-driven crane like this. The cost may be far less than you had imagined. One crane owner thought it would cost him nearly four times this price to duplicate his crane.

Borg-Warner Industrial Cranes offers a complete line of overhead cranes . . . for light, medium or heavy service . . . constant or intermittent service at slow, medium or high speeds . . . operation from cab or floor. Get in touch with B-W Industrial Cranes today for answers to your materials handling problems.



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Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago, 3, Illinois

# Why Faster Growth Is Needed

**There must be more business investment if the U. S. is to improve its growth rate.**

**Present pace puts the nation at a disadvantage both at home and abroad.**

- One of the hottest economic debates in 1959 was over the rate of U. S. growth.

There has been a lot of concern about the "race" between the U. S. and the U.S.S.R. in advancing the Gross National Product. Many consider the U. S. rate of growth—about 3 pct a year—not large enough.

**Red Timetable**—In stepping up output, the Russians are moving at a rapid rate. Thirty years ago Russian output was only 8 pct of the U. S.'s. Now it's 40 pct. According to Russian plans, the U.S.S.R. will catch—and then surpass—U. S. output by the early 1970's.

This Russian competition has put the spotlight on U. S. efforts to improve productivity. But there are other equally strong reasons for faster growth.

**Trade Problems**—Unless U. S. productivity gains can match those of other nations (right now they are not) the country faces tougher trade problems. Competing in world markets will be difficult. And more foreign competition will cut deeper into domestic markets.

Industrial growth has been getting lots of attention during current tax reform hearings before the House Ways & Means Committee. Business spokesmen keep stressing that more investment is needed to spur economic progress.

"We must see to it that business

investment is increased, if we wish to speed up our rate of progress," says George Terborgh, research director of the Machinery and Allied Products Institute.

**What Could Be Done**—Another witness, Roland M. Bixler, president of J-B-T Instruments, Inc., wants the U. S. to "pull down the tax rate barricade to greater capital accumulation and use in our private economy."

Thorough tax reform is possible

in a few years, he adds, if the U. S. pre-empts the revenue gain from economic growth. Mr. Bixler notes each one pct of economic growth (as measured by the GNP) results in a tax gain of \$1 billion.

Thus the present growth rate of the U. S. means a revenue gain of \$3 billion a year. The larger growth rate of the 1930's—about four pct—would bring a tax return of \$4 billion.

## Exports: Some Good News

- The news is not all bad on the subject of U. S. foreign trade.

It's true the U. S. share of export markets for goods has been declining. But it is not true that all U. S. products are losing out to foreign competitors.

**Some Even, Some Gains**—This is pointed out in a new study on exports made by the Bureau of Foreign Commerce, U. S. Department of Commerce. Based on 1958 figures, the report shows many products held their share of regional markets abroad. Many, in fact, made gains over the levels selected as a basis for the study, the years 1954-1956.

Two industries have suffered heavily in the export market—autos and steel. Reduced auto sales abroad accounted for more than \$300 million of the \$500 million decline in exports.

**Third Quarter Up**—Other American products fared better in the export market during 1958. Gains were chalked up by railway equip-

ment, inorganic chemicals, and textile products. There were smaller gains for a variety of chemical items, instruments, and metalworking machinery.

And this year, during the third quarter, U. S. exports increased sharply. Total exports (excluding military goods) rose on a seasonally adjusted annual rate to \$17.3 billion.

## What's Best Reason For Worker Time-Off?

The best reason an office worker can use to get time off with pay is a death in the family. The best reason for a factory worker is jury duty.

The excuse least likely to bring time off for either employee is the wedding of a relative.

At least that's what was shown by a survey of The University of Michigan Bureau of Industrial Relations conducted in Detroit, Grand Rapids and Saginaw.





*The smoother surface of*  
**CONTOUR-WELDED\***  
**STAINLESS TUBING**  
*gives it greater resistance to corrosion*

Recent tests prove: (1) Contour-welded tubing is smoother than any other tubing, and (2) this extra smoothness provides greater resistance to corrosion.

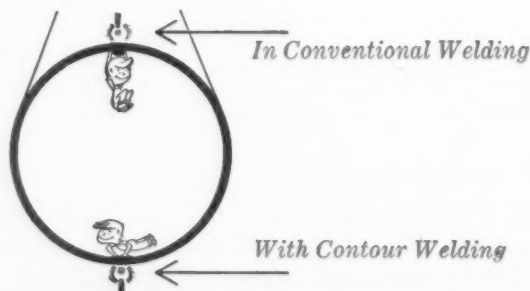
Here's how TRENTWELD® tubing, made by the exclusive Contour-Weld process, compares with other full-finished tubing:

- It's smoother than seamless because it's formed from uniformly rolled strip steel, whereas seamless is extruded or pierced.
- It's smoother than other welded tubing because the Contour-Weld process, patented by Trent, virtually eliminates the weld bead.

Other tests prove this smoother surface provides *increased resistance to corrosion* — because there are fewer focal points for corrosive attack. Not only that, the smoother surface ensures *longer fatigue life* and *less product incrustation*.

But get full details. Our free 48-page "Trentweld Manual" gives complete data on Contour-Welded tubing in sizes from 1/8" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy and Hastelloy.† Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.

†Trademark Haynes Stellite Co.



In CONVENTIONAL WELDING of tubes, gravity pulls the molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

\*With CONTOUR-WELDING the tube is welded at the bottom. Gravity still pulls the molten metal down inside the tube, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.



*stainless and high alloy pipe and tubing*  
**TRENT TUBE COMPANY**

Subsidiary of Crucible Steel Company of America • GENERAL OFFICES: East Troy, Wisc. • MILLS: East Troy, Wisc.; Fullerton, Calif.



# Will the Gas Turbine Make It?

## New Engine Develops 75 hp, Weighs Only 75 lb

**The gas turbine is still waiting in the wings for a chance to replace the piston engine.**

**This new engine is evidence of further progress, but is it enough?—By A. E. Fleming.**

■ In recent years, boosters of the gas turbine engine have been like theater understudies — anxiously awaiting the day when the star performer steps down.

Unfortunately for gas turbine hopefuls, the auto industry's ancient headliner, the reciprocating engine, gives no sign of relinquishing its star role. In fact, increasing use of aluminum is making the present powerplant more appealing than ever.

**New Gas-Turbine**—While waiting in the wings, the people who make gas turbines aren't losing hope. They are constantly improving their package. Latest proof of this is a gas turbine engine that, according to the producer, could easily be used in the new small cars introduced last fall.

The developer is S. B. Williams, president of Williams Research Corp., Walled Lake, Mich. He is no novice. He formerly worked for Chrysler Corp., most ardent of the auto industry's gas turbine researchers, on reciprocating engine development and turboprop engine design.

**Big as a Breadbox**—Mr. Williams is exploring the market with a gas turbine engine that uses a heat-exchange principle. It is the size of a breadbox. It generates 75 hp and scales 75 lb. This is roughly one-third the weight per horsepower of previously-announced gas turbines

with heat exchangers. (A heat exchanger uses exhaust heat to make more efficient use of fuel.)

The gas turbine engine uses fuel combustion and compressed air to whirl a turbine which runs a drive shaft. In the past, the high cost of making small turbine engines has limited their use to military applications. "My engine is designed for manufacture by existent mass-production methods, making it competitive with medium-priced reciprocating engines," says Mr. Williams.

**High-Priced Model**—More than 50 pct of Mr. Williams' turbine is made out of aluminum alloys. The rest is ferrous and non-ferrous alloys. But he must further develop low-cost ways to turn out some of the heat-resisting parts used in the gas turbine. It has already cost \$1 million to develop the Williams model.

Excessive thirst for fuel has been a gas turbine trait. Auto firms have reported major improvements along this line in the past year. Mr. Wil-

## German Engine Has Two Moving Parts



**One Plug:** Rotating Combustion engine, developed by West Germany's NSU Werke Motor Co., financed by Curtiss-Wright Corp., has one spark plug, a carburetor and two moving parts. A three-cornered rotor fits in the single combustion chamber. A shaft passes through the rotor and makes it move in an eccentric orbit by means of two gears.

Liams says his engine provides fuel economy approaching the most modern automotive piston engine. It can run on kerosene, diesel or standard gasoline fuels. Because of the heat exchanger the engine is partially powered by its own exhaust. The engine runs at a normal 58,500 rpm.

**Future Uncertain** — Outlook for any of the gas turbine engines now being researched is clouded as far as actual adoption by the auto industry is concerned. The engine has many favorable qualities: Simplicity, ease of manufacturing and servicing, reliability, freedom from vibration, lightness, need for only a simple transmission system, and fuel variety.

Perhaps the main technical problem at present is the task of coming up with inexpensive heat-resistant materials. These are needed so the engine can perform efficiently at high temperatures and speeds. The heat resistant materials must be suitable for mass production.

**Sentimental Favorite** — Aside from this, tradition is probably the

greatest hurdle. And tradition favors the present engine. Its endorers say the full potential of present engines hasn't been reached. They point to weight reduction through the use of aluminum as a means of further improvement.

They have a point. Current evidence favors the continued use of the reciprocating for some time to come. Meanwhile, we will continue to see further improvements in what is becoming known as the old standby—the gas turbine engine.

Around-the-clock operations are in store for American Motors workers in Wisconsin in January.

The company will start a third shift, hire an additional 3500 employees and boost output in the first and second quarters of 1960 by 33 pct.

By late February the final assembly plant at Kenosha and the body plant in Milwaukee will be running 24 hours a day, 6 days a week.

**Production Climbs** — During the first quarter of 1960, 133,000 Ramblers are scheduled. This is 33 pct more than the 100,258 made in

corresponding 1959 period. In the last quarter of 1959 some 113,800 Ramblers were programmed. This was 35 pct more than the 84,279 produced in same period a year earlier.

Outlined for the second quarter of 1960 are 155,500 cars, 33 pct more than the 116,513 made in the same quarter of 1959.

**Employment Climbs** — Effect of the latest program will be to expand body production at Milwaukee by 25 pct, from 1200 daily to 1500. Final assembly at Kenosha will rise from 1750 daily to 2200. By late February, employment in Kenosha and Milwaukee will be over 27,000.

Other expansion plans and more hiring lie ahead. Aim is to have enough capacity and personnel to attain an annual production rate of 600,000 units by the time 1961 models start rolling from the assembly line next fall.

Through December 10, Rambler sales in the 1959 calendar year numbered 348,184 units, or 94 pct higher than the 179,302 recorded through the same date in 1958.

## The Bull of the Woods



## Speed Control Device

Another step toward automatic control of passenger cars is being taken by AC Spark Plug division of General Motors. The latest system is called Acon-O-Cruise. It is operated by vacuum from the engine manifold. Neither electric motors nor springs are used, as in other cruise control systems.

AC's package will sell for half the price of current devices.

**Speed Warning** — The Acon-O-Cruise combines an adjustable speed-control setting and a silent speed-warning signal. It senses speed through a governor attached to the car's speedometer cable. It can be used to control speed automatically down to about 30 mph.

Cars with Acon-O-Cruise can travel for miles on turnpikes or open highways without a foot on the accelerator. It will hold within two miles per hour of the pre-selected speed, even on hilly roads.



*The case of*

## **THE ALMOST PERFECT DESIGN**

This is a closeup of an equipment failure. Somewhere in the basic design, someone forgot to specify a nut that would hold fast. Now the entire piece of equipment is idle. Does it matter how good the overall design is?

The most brilliant engineering concept can be obscured or cancelled out by the failure of components. In the final analysis, then, a design which does not include fail-safe performance for the benefit of the user—and the protection of the maker—is inefficient and uneconomical. In the eyes of the customer, a failure of the smallest part is failure of the unit.

For bolted connections, it is possible to obtain "design insurance"... an extra margin of operating dependability that can mean the difference between satisfaction and a field breakdown... by specifying an Elastic Stop® nut

with the failure-proof red nylon locking insert. The nylon insert will not destroy bolt threads or finishes; it is non-galling; it will withstand severest vibration, shock and impact loads; and it can be re-used over fifty times on a bolt of standard quality.

ESNA offers a broad line of standard and thin height hex nuts, and a size range from 0-80 to 3". Also many special configurations to solve your unusual design problems. For detailed information and photos showing how the designs of some of America's foremost manufacturers of heavy equipment have utilized Elastic Stop nuts for critical bolted connections... write to Dept. S32-1277, Elastic Stop Nut Corporation, 2330 Vauxhall Road, Union, New Jersey.



### **DOUBLE DEPENDABILITY**

The dependability built into every Elastic Stop nut builds itself into the dependability of every product on which it is used.

**ELASTIC STOP NUT CORPORATION OF AMERICA**



**Cu**  
97.50%

**Ni**  
1.90%

**Si**  
0.60%

**NEW**  
FROM  
**ANACONDA**

*Announcing*  
**CUNISIL-837**

a versatile high-strength, heat-treatable  
copper alloy with this valuable  
combination of properties

**HIGH  
TENSILE STRENGTH**  
90,000 psi min., in  
precipitation-hardened  
condition.

**READY  
MACHINABILITY**  
Compared with Free  
Cutting Brass Rod at 100,  
its machinability  
rating is  
approximately 40.

**HIGH  
YIELD STRENGTH**  
70,000 psi @ .50%  
extension under load,  
min., in precipitation-  
hardened condition.  
Elongation in  
4 x D, min., 8%.

**HIGH CORROSION  
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Comparable to copper  
and Everdur copper-  
silicon alloys.

**HIGH ELECTRICAL  
CONDUCTIVITY**  
30 to 42% IACS  
as heat treated.

**EXCELLENT  
COLD FORMING**  
Extremely easy to work  
cold before hardening  
heat treatment.

**AVAILABLE  
AS ROUND ROD**  
In straight lengths  
including  $\frac{1}{16}$ " dia.  
to 1" dia. In coils  
 $\frac{3}{16}$ " dia. to  $\frac{5}{8}$ " dia.  
Inquire for  
other sizes.

**METALLURGICAL COMMENT.** Most of the nickel and silicon in heat-treated Cunisil are present as an intermetallic compound, nickel silicide, and it is the precipitation of nickel silicide in the form of particles of submicroscopic size by a relatively low temperature heat treatment that accounts largely for the distinctive properties of the alloy.

Prior to the hardening heat treatment, the alloy is brought to a proper condition for hardening by giving it a solution anneal at a much higher temperature and then a quenching from this temperature; at this stage the alloy is quite soft and in a condition for drastic cold-working operations. The hardening heat treatment consists of heating at a controlled temperature for a definite length of time to obtain the desired mechanical properties.

**CUNISIL-837** is a high-strength, corrosion-resistant alloy that includes many of the desired qualities of Silicon Bronze or Everdur®. Its applications to date have been primarily in the electrical equipment field.

**FOR MORE INFORMATION**—see your American Brass representative or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ED47

**ANACONDA®**  
Copper and Copper Alloy Mill Products  
MADE BY THE AMERICAN BRASS COMPANY



# Service Merger Battle Looms

## Congress to Debate One Armed Force

**Combining the armed forces into one fighting unit will be up for some hot debate in the next Congress.**

**It is seen as a cost cutting merger, but there are drawbacks.—By G. H. Baker.**

■ A hard push will be made in 1960 to force a merger of the Army, Navy, Marine Corps and Air Force.

The Air Force is hot for such a merger. The Navy and Marine Corps are opposed. Army is hesitant; hopeful, on one hand, of regaining its former place at the head of the table, yet fearful of being swallowed up by the ubiquitous Air Force.

**Full Weight**—The Air Force is throwing the full weight of its political power and prestige behind the plan. In addition, many industrial contractors and subcontractors, hopeful of obtaining more government business from the all-powerful Air Force, are beating the drum for a single U. S. military service.

On the surface, the idea of a general staff has certain merits. Rivalry between and among generals and admirals—which runs up the total bill for defense without adding to defense—is ended. Duplicate and triplicate buying of military supplies and equipment is wiped out in favor of central procurement. The enormous volume of paperwork and its related big payrolls for clerical hire can be cut down. Most important, there is an end to top-level haggling between the services in arriving at decisions.

But there are a number of undesirable—even dangerous—features of a single military service

and an all-powerful staff. For example: A \$41-billion-plus defense budget, for example, in the hands of a single, disciplined group could become a formidable political force in the country and in one way or another could swing a lot of votes its way.

### Manned Aircraft Buying Cut

More cut-backs in government procurement of piloted aircraft are in the works. Recently, the Pentagon ordered further trimming of its orders for B-58 Hustler bombers, and some further pruning of other programs involving manned aircraft is under study.

In the case of the B-58 bombers, the Air Force has decided to buy only 20 instead of the 32 originally planned. Convair Div. of General

Dynamics is the prime contractor.

It's part of a continuing Pentagon policy of shifting emphasis from manned to unmanned aircraft. Money saved by cutting back contracts calling for piloted aircraft is switched to missiles and rockets.

### Citizens Must Pay Or Stop Asking

The government must stop "living on credit cards," the head of the U. S. Budget Bureau insists. Maurice H. Stans says citizens must wake up to the fact that the nation must pay its way. They must quit demanding new federal benefits of Congress that they are unable or unwilling to pay for.

The federal government is piling up CODs for the years ahead at an alarming rate.

## Closer Check on Steel Imports

■ The Treasury Dept. is instructing customs field officers to withhold appraisal of entries of a number of Japanese steel products. The holdups will be made to determine whether these items are being sold in the United States at less than fair value.

**The List**—The products include: Steel concrete reinforcing bars (deformed a plain); steel bars (flat, round and square); steel plates; hot-rolled steel sheets; galvanized steel sheets; steel angles, beams and channels.

Under the Antidumping Act, determination of sales in the U. S. at less than fair value would require reference of the case to the

Tariff Commission. The Commission would consider if American industry is being injured. Both dumping price and injury must be shown to justify a finding of dumping under the law.

**Shovels, Too**—The Treasury has also determined that shovels from Japan are not being, nor are likely to be, sold in the U. S. at less than fair value within the meaning of the Antidumping Act.

Appraising officers are being instructed to proceed with the appraisal of shovels from Japan without any regard to question of dumping.

Notice of the finding will be published in the Federal Register.

# Farwest Economy In Good Shape

## But Businessmen Have Problems Facing Them

**West Coast business is in good economic straits. But more and more problems are creeping up.**

**Businessmen are concerned with the future. Here are some of the things they worry about.**  
—By R. R. Kay

■ Today, Northwest economy is holding its own—not far off the national pace. But the picture since

World War II is this: A declining rate of industrial growth and more and more dependence on aircraft and missile making.

**Years Ahead?**—What about the future? Here are three key questions posed by Miner H. Baker, vice president and economist, Seattle-First National Bank:

1. Will the aircraft industry prove to be a stable element in the region's economy?

2. Will the resource-based industries — especially timber and food—show growth, or will they continue to lag?

3. Will other industries grow and make more jobs?

**Employment Down** — Aircraft employment keeps dropping. And more layoffs are on the way.

But the outlook is far from gloomy. Boeing Airplane Co., Seattle, is Washington's largest industrial employer, with 60,000 people on the payroll. One of the top defense contractors in the country, it has a backlog of \$1.7 billion. This is split 35 pct commercial and 65 pct military.

**Top Four**—Aircraft is, in fact, the smallest of four primary employment groups in the Pacific Northwest. The others are agriculture and food processing, forest products and diversified manufacturing.

Forest industries show improvement this year. Business is up in plywood, and pulp and paper. But lumber isn't doing too well.

**Bright Spot**—Construction, a big steel user, is a bright spot in the region's economy. Residential, commercial, and industrial building permits are way up. Heavy construction includes major projects like these:

1. \$100 million plutonium reactor at Hanford, Washington. Kaiser Engineers is the builder for the Atomic Energy Commission.

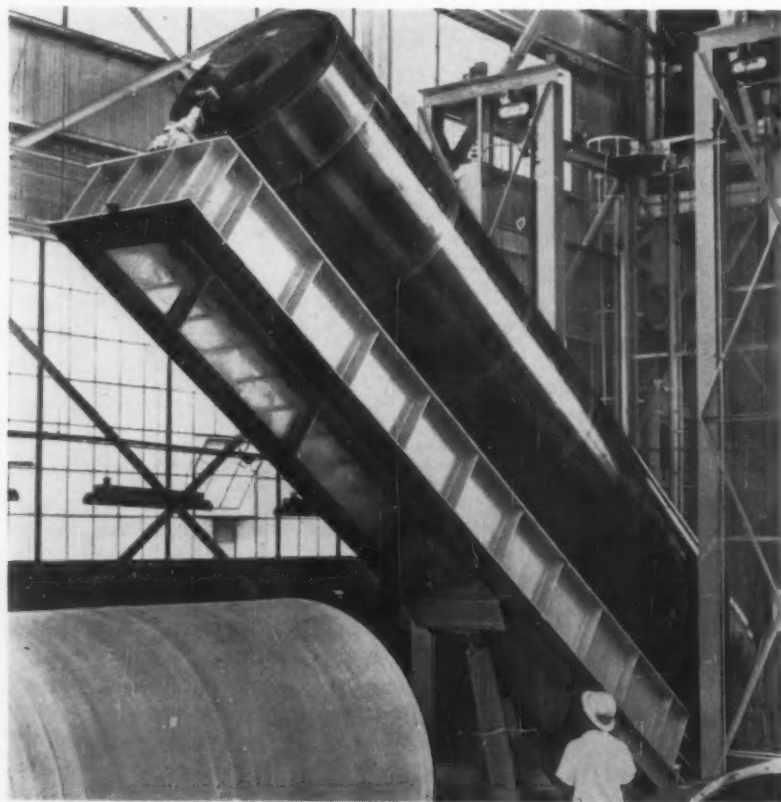
2. \$93 million Wanapum Dam on the Columbia River.

3. State highway construction.

4. Oil refineries.

A step-up in aluminum production is behind an increased demand for power. ♣

## A Holder for the Polaris



**PROTECTIVE COVERING:** Now in production at Lockheed's California Div. at Burbank is this double-lined, shockproof, shipping

container for the Navy's Polaris Missile. The pressurized containers are designed for air, rail or truck transportation.

## QUESTION:

Can you cold head  
this drill chuck key?



ANSWER: YES! with



engineering and KEYSTONE XL WIRE

Questions like this are asked every day at Central Screw Co., Chicago, Ill.—and this is a typical answer! For Central Screw depends on Keystone XL Wire to head more than 7,500 stock items by the millions—and for many of its 20,000 specials. Here, as with many other progressive fastener manufacturers across the country—"know-how" combines with Keystone XL Wire quality and flowability to produce a superior product at sharply reduced costs.

For example, by cold heading this drill chuck key, gear cutting was eliminated and machining was reduced. Overall costs were cut about 50%. This is one of millions of examples of how Central's "Fasteneering"® profitably puts Keystone XL Wire to use. You can do the same. Your Keystone representative will help you. Call him!

Keystone Steel & Wire Company, Peoria 7, Illinois

Five operations now produce this chuck key: heading on a 2 blow header, cut pointing, drilling, chamfering and heat treating.



More Central Screw examples of Keystone XL Wire flowability are (above) this fastener with an 8 diameter thin shell head, and (right) fastener with 6 1/2 diameters in the sharp, clean head and square shoulder.



ACTUAL SIZE



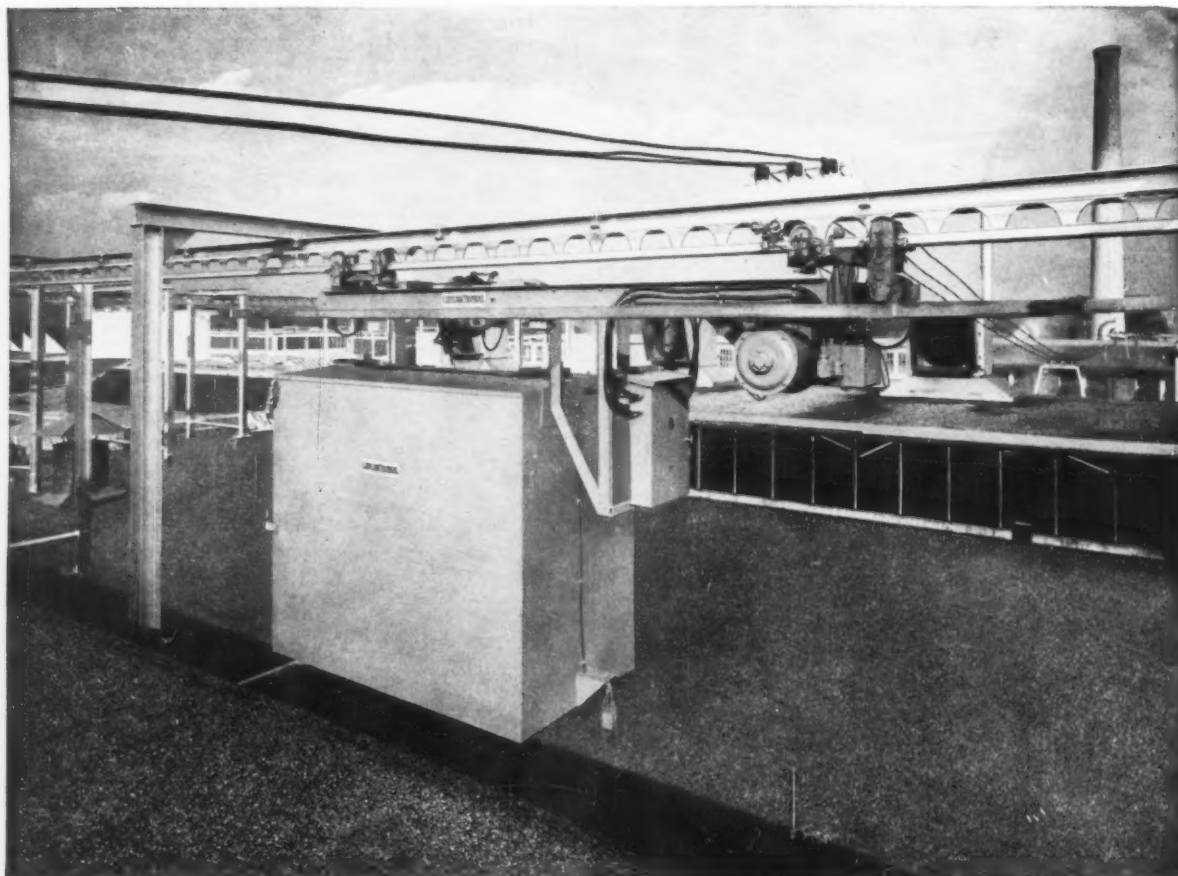
# KEYSTONE

WIRE FOR INDUSTRY



# AUTOMATIC Materials Handling System Operates On Roof

*Has paid for itself  
several times over  
since installed*



**T**HE box-like structure that you see in the photograph above is a traveling van that measures 4'-0" x 8'-0" x 6'-6" high. It is built into a motorized carrier that travels over an extensive Cleveland Tramrail system built on the roof of a large prominent plant.

A large door at the opposite end of the van is swung open during loading. Pallet loads of materials are brought inside the van and set in place. 3000 lbs. can be handled with this particular unit per trip. Other larger units are available.

No special operators are required for the Tramrail system, as it can be kept going easily by the production machine operators along with their regular work. After the van is filled, pressing a button starts the load on its way. The van first travels upward until it is above the roof. Then it goes forward over the extensive track system. When it reaches the roof over one of the two receiving stations, as preselected, it makes the vertical descent to the floor. Here the door is opened and materials removed.

This system brings distant departments close together so that they can operate as efficiently as if

they were adjacent to each other. It eliminates need of wide load-carrying aiseways — and thereby saves considerable floor space. It avoids confusion and danger of floor trucks which would normally be required. It greatly cuts costs by drastically reducing time required for materials handling. In fact, the savings made by this system have been so great that it has paid for itself several times over since installed.

Very likely you, too, can make big savings by putting to work that big unused roof of yours. Cleveland Tramrail engineers stand ready to show you how.



Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4820 E. 290 ST. • WICKLIFFE, OHIO



# Automation Takes New Course

## Trend Is to Smaller, Special Purpose Machines

**Giant, multi-station transfer lines characterize the emergence of automation in the 1950's.**

**Interest is shifting to special machines that do things others can't.—By R. H. Eshelman.**

■ Has the monolithic transfer line reached its peak?

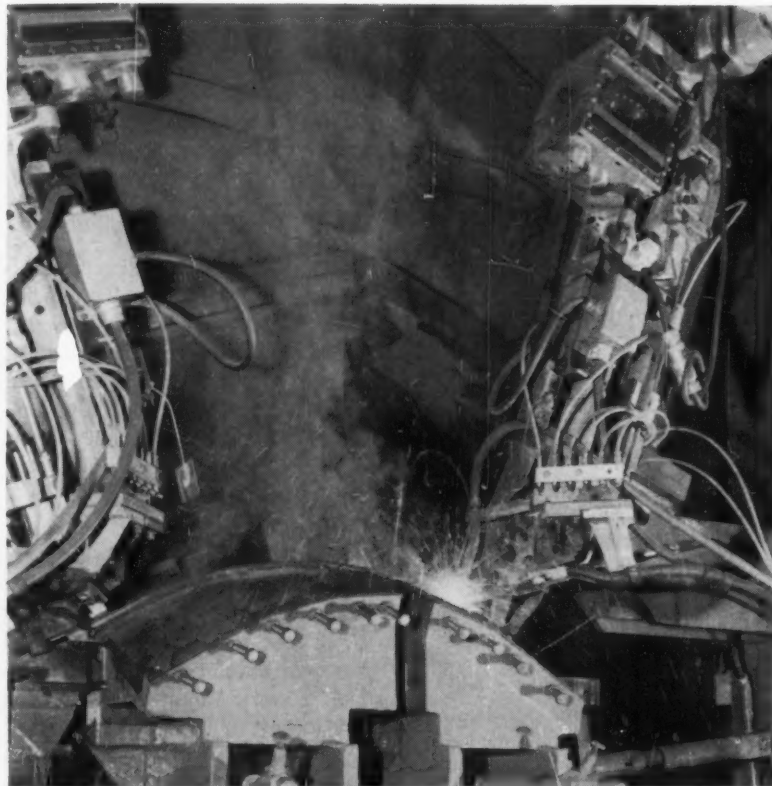
Unbroken automation units, winding up and down the plant from door to door, are typical of mass automobile production in the 50's. The big lines meant big business to machine builders. Larger transfer lines still have their place. But what will be the trend in the sixties?

Industry sources acknowledge that major areas for these installations have been pretty well exploited. Few machine tool experts look for another wave of plant-wide modernization such as revolutionized engine production in the mid-fifties.

**Special-Specials**—Insiders say interest now centers on smaller areas—trunnion, center-post, rotary index, constant-travel (circular) units, integrated automation, and even specially tooled automatic bar machines. One tool builder describes them as "special-specials." They do something no other machine can.

Key to their success often is some unique control feature. Such developments reported in the last year or so include tape-controlled transfer, ball-stud milling, TVX inspection, static-controlled press line and weigh-milling for pistons. There are others.

**Join Halves**—Typical of this current trend is a new mechanical-follower tracer which automates a hand welding job. The job is join-



**DRAWING A BEAD:** Mechanical tracer controls welding operation on an automotive frame, following the continuous contour of the piece.

ing halves of automobile frame members.

Contours of the pieces vary as much as 3/16-in. To automate this job some kind of "feedback" is needed. Expert Welding Machine Co., the builder, came up with mechanical "brains." They direct joining of untrimmed, contoured edges in a continuous, automatic operation.

The basic welding carriage moves along the parts, directed by a contour cam. This "program," however, is modified by a tracer system. A mechanical probe picks up the actual contour line. Variations

between the design shape and the actual line are noted by the mechanical memory. This then directs the welding head as it progresses.

**Rollers and Pins**—Memory unit, a drum with pins around the circumference, only stores variations. It checks these against the program cam. Directed by probe and tracer, a "set" cam positions and locks these pins. Then a roller, riding atop the pins, reads out the information to position the machine head. After passing the output shaft, pins are pushed back to bottom position by fixed cams.

## INDUSTRIAL BRIEFS

**Annual Contest**—The Copper & Brass Research Assn. is sponsoring its second annual competition to honor the year's most outstanding contribution to the use, application, or metallurgy of copper and copper-base alloys. The winner will receive \$1000 and a bronze award to be presented May 17 at the Association's annual meeting in Hot Springs, Va.

**Morgan Elected**—W. H. Morgan, president, The Morgan Engineering Co., Alliance, O., was elected president of the Electric Overhead Crane Institute at its annual meeting held in the Carlton House, Pittsburgh.

**Meaker Sold**—The Meaker Co., Chicago, manufacturer of automatic systems, has been purchased by Sel-Rex Corp., Nutley, N. J. The Meaker Co. will operate as a wholly-owned subsidiary, under the general supervision of its present staff.

**Committee Week**—The American Society for Testing Materials' Committee Week meeting will be held at Chicago, Feb. 1-5, 1960, at the Hotel Sherman. Technical committees will meet all week. A panel on Color and Gloss of Anodized Aluminum will be held Feb. 4.

**Southern Separation**—Linde Co. has put a new separation plant on stream at Mobay Chemical Co. at New Martinsville, W. Va. This unit will produce 25 tons per day of medium purity oxygen simultaneously with 25 tons per day of high-purity dry nitrogen. The oxygen will be used in various isocyanate processes.

**Pacific Deal**—Metal Control Laboratories, Huntington Park, Calif., has purchased Pacific Testing Laboratories, Inc., Van Nuys, Calif. Pacific's equipment and personnel will be moved to the Metal Control Laboratories location in Huntington Park.

**Up to Date**—Buffalo Steel Corp. has started a \$400,000 modernization of its rolling mill in Tonawanda. The program includes installation of new shearing tables and conversion of a portion of the plant to 60 cycle electric power from 25 cycle.

**Number 11**—A. M. Castle & Co., steel distributor, plans to build a modern steel service center in Galion, O. It is scheduled for completion in April next year. The facility will be the eleventh steel and aluminum service center for the company.

**More Than Planned**—Kaiser Steel's oxygen steelmaking furnaces at Fontana, Calif., are producing steel in individual heats 70 pct larger than original design capacity. Each of the company's three furnaces was initially expected to handle 65 ton heats. Production today is consistently in heats of steel greater than 110 tons.

**Kite and Key**—A buck-boost electrical system to power an ore bridge will be installed in 1960 at U. S. Steel's Gary Steel Works. It has been developed jointly by General Electric and the American Bridge Div. of U. S. Steel. The new design will provide economical means of utilizing 250-volt d-c potential power system to obtain adjustable-voltage drives.

**Digging In**—The McKay Co. has broken ground in York, Pa., for a \$500,000 expansion. New facilities will be completed in 1960. The building will provide capacity for manufacturing McKay's line of mild, stainless steel and hard surfacing welding electrodes and automatic and semi-automatic welding wires.

**Doubles**—The Fafnir Bearing Co., New Britain, Conn., will double the size of its nearby Newington plant to increase capacity and reduce costs. The addition will be started early in 1960. Expansion will enable the company to process larger size rings from start to finish in a one-floor operation.

**Take a Line**—Ward Tool & Machine Co., Inc., Alden, N. Y., will build a \$500,000 plant in Alden next summer. The company has acquired the hydraulic cylinder line of Hydreco Div. of New York Air Brake Co., Kalamazoo, Mich. Purchase includes machine tools, engineering patterns and work in progress.

**West Coast Opening**—Wolverine Tube, Div. of Calumet & Hecla, Inc., has opened two new district sales offices in Los Angeles and San Francisco. Wolverine had been represented by Van D. Clothier, Inc., as west coast agent for the company.

**Newark News**—The American Welding Society, New Jersey Section, will hold a two-day Welding Educational Seminar on March 16-17, at the Essex House in Newark. There will be technical sessions and field trips to welding research laboratories and fabricators in the Newark area.

**Achtung**—Dow Chemical International Ltd., S. A., has formed a new company, Deutsche Dow Chemie GMBH, with corporate headquarters in Dusseldorf. The wholly-owned German subsidiary will provide German operators of oil and gas wells with acidizing, fracturing and cementing services.



"You're hired!"



**C. M. Basile**, elected president, Link-Belt Speeder Corp.

Allis-Chalmers Mfg. Co., Atomic Energy Div.—**R. M. Casper**, elected vice president and general manager.

Westinghouse Air Brake Co.—**E. J. Green**, elected vice president, planning and marketing.

Chapman Valve Mfg. Co.—**F. D. Crowther**, elected vice president and general manager.

Leader Iron Works—**W. J. Kalmeyer**, elected president.

National Malleable & Steel Co., Industrial Div.—**J. F. Torley**, appointed vice president, manufacturing.

Republic Steel Corp.—**R. F. Dunlavey**, appointed asst. superintendent, Finishing Dept., Buffalo steel plant.



**R. R. Rhodehamel**, appointed general manager, Cone Automatic Machine Co., Inc., Windsor, Vt.

Revere Copper & Brass Inc.—**E. G. Skavdahl**, appointed asst. general manufacturing manager.

Olin Mathieson Chemical Corp., Metals Div.—**J. F. Krepley**, appointed extrusion product manager, and **R. E. Clay**, named transportation sales manager.

Clevite Corp.—**W. D. Prescott**, elected secretary.

The Farrel-Birmingham Co., Inc., Watson-Stillman Press Div.—**S. T. Bowden**, appointed sales manager.

Republic Steel Corp.—**W. N. Marble**, appointed asst. superintendent, Cold Strip Dept., Gadsden, Ala., plant.

Niagara Machine & Tool Works —**N. C. Drechsel**, appointed manager, Boston district office.

Kasle Steel & Aluminum Co.—**C. S. Warner**, named field manager, Chicago area.

L. B. Foster Co.—**J. P. Rhein**, named controller.

Aluminum Foils, Inc.—**T. W. Allison**, appointed vice president, marketing and sales.

U. S. Steel Corp., U. S. Steel Products Div.—**J. P. Munsch**, appointed Sharon district manager.



**R. L. Gibson**, appointed general manager, Transformer Div., General Electric Co., Pittsfield, Mass.



**H. K. Porter**, becomes president, H. K. Porter, Inc., Somerville, Mass.

U. S. Steel Corp., Tennessee Coal & Iron Div.—**S. C. Steele**, named asst. manager, sheet and strip product sales.

The Torrington Mfg. Co., Machine Div.—**E. V. Cavagnero**, promoted to chief design engineer; **Werner Vogt**, promoted to chief development engineer.

The Youngstown Sheet & Tube Co.—**C. W. Fetter**, appointed asst. district sales manager, Detroit.



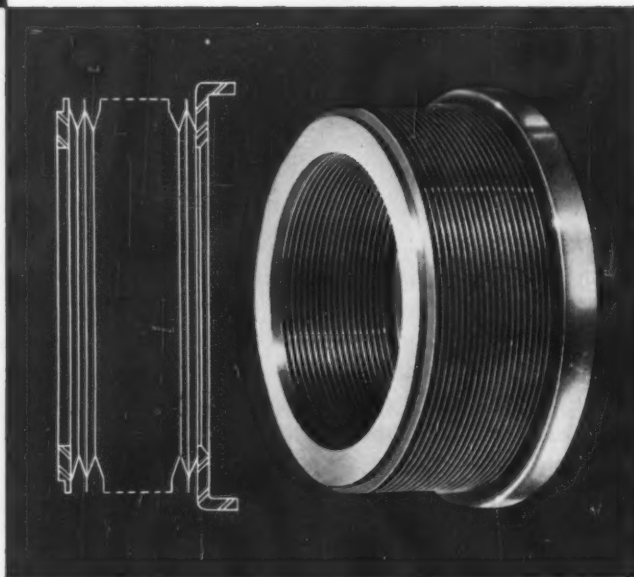
**J. G. Wilsterman**, appointed manager, sales, Wire Div., Republic Steel Corp.





## DESIGN NOTES

# How C/R's New Metal Bellows Seal Meets Seemingly Impossible Operating Conditions



### Operating Ranges

Temperature	-400° to 1000° F.
Pressure	500 psi
R.P.M.	80,000 plus

These known operating ranges indicate the function of this seal. It is designed for applications where temperatures and mediums to be sealed forbid the use of any organic materials. Typically, these applications include fuel pumps, compressor power units and turbine starters characteristic in rockets and missiles. Other applications include mechanisms which are exposed to a high level of radioactivity.

### Design Advantages

The C/R metal bellows seal consists of a metal bellows — a welded homogeneous unit which is secured at one end — and a carrier ring in which the sealing face is mounted. The seal does not contact the shaft. It is stationary, and the only rubbing surfaces are the sealing face and mating ring. These surfaces are precision lapped to provide a positive seal with minimum friction. At any given pressure, the seal can be designed to maintain proper and constantly effective face loads. It orients immediately to run-out and will resist any torques it is subjected to in operation. The design has high end-play tolerance: Chicago Rawhide engineers have deflected a bellows .100 in. for three million cycles at 1750 cpm and at a

temperature of 500° F. with no adverse effects.

A further advantage is relatively light weight and compactness. The C/R metal bellows seal can be designed for minimum axial and radial space. Axially, complete seals can be produced within a ¼ in. cross-section. Radially, dimensions are comparable with conventional end face seals.

The C/R metal bellows seal can also be designed with an extremely low coefficient of expansion. The importance of this factor becomes apparent with the fact that in many applications the operating temperature may change hundreds of degrees in a very few seconds.

### Mediums To Be Sealed

Virtually any known liquid or gas may be positively sealed with this design, depending upon duration or service life. From a practical viewpoint, the C/R metal bellows seal is the best design for the sealing of cryogenic and high-energy fuels such as LOX, hydrogen peroxide, fluorine and other missile and rocket propellants.

Where possible, lubrication of the two sealing faces is desirable to prolong service life. However, the medium being sealed commonly acts as the lubricant and may be merely hot gas.

### Materials

Sealing faces and mating rings for the C/R metal bellows seal are available in

a variety of materials including carbons, carbides, ceramics and various alloyed metals for both high temperature and corrosion resistance. The bellows can be furnished in any of several metals and alloys such as stainless steel, Monel, Inconel X, Ni-Span C and other special alloy steels.

### Consult C/R Engineers

Each application for the C/R metal bellows seal is essentially a custom-design and an intimate knowledge of all conditions to be encountered must be known by Chicago Rawhide engineers to produce the correct combination of properties in the seal. Then, whether you require five, fifty or five thousand seals, Chicago Rawhide will design and produce the correct seal to solve your problem.

### Helpful Design Data:

We will gladly furnish you with a design guide and space envelope data concerning the C/R Metal Bellows Seal. Just write for Bulletin MBS-1 on your company letterhead.

## CHICAGO RAWHIDE MANUFACTURING COMPANY

1219 Elston Avenue • Chicago 22, Illinois

Offices in 55 principal cities

In Canada: Chicago Rawhide Mfg. Co. of Canada, Ltd.,  
Brantford, Ontario

Export Sales: Geon International Corp.,  
Great Neck, New York





Union Carbide Plastics Co.

**IRREGULAR SHAPES:** Epoxy die is responsible for producing 130,000 parts for an auto radiator at much less cost than conventional all-metal die.



CIBA Products Corp.

**EPOXIES FOR RAILROADS:** Epoxy resin, embedded in the coil, helps form large traction coils for locomotives in the railroad industry.

## Epoxy Resins Gain Ground As Partners of Metals

By G. F. Kingsley—General Manager, Pylon Co., Inc., Attleboro, Mass.

Scan down the list of some of the present-day uses of epoxy resins and you wonder why more companies aren't using them.

Yet, big companies are investing in epoxies right now. The reason: Savings are involved.

■ Epoxy resins are on the march. And they're marching right into the metalworking field. Chances are that these materials can find some useful areas in most production setups.

The past experience of more than 1000 companies serves as proof of

the ways in which epoxies can replace present materials at quite a saving. More than often, they'll improve production performance.

Some companies realize savings as high as 70 pct over a wide range of usage. This covers everything from making plastic tools and foundry dies to the bonding of railroad tracks and airplane parts.

In the pure state, epoxies are seldom used. Instead, they are formulated to suit various needs. Their properties include excellent adhesion, high resistance to chemicals and solvents, and low shrinkage on cure.

**Bright Future**—At present, most

epoxy resins go into protective coatings. In fact, this single area accounts for nearly 75 pct of their total consumption. But their growing use in highways, as well as in piping and tooling applications, should help reduce this figure for coatings to about 55 pct by 1963.

The second largest outlet for epoxies is in plastic tooling. Here, the biggest users of epoxy tooling are the automotive and aircraft industries. One auto maker alone spends about \$1,600,000 a year on epoxies for prototype and die model work.

According to several major aircraft companies, 20 pct of all their

## Epoxies Lower Foundry Costs

Tool	Material Cost, \$	*Direct Labor, \$	Material Cost, \$	*Direct Labor, \$	Savings, \$
Side Frame Pattern	280	1800	488	450	1142
Side Frame Core Box	39	180	70	33	116
Core Box B	17	93	30	27	53
Core Box C	10	48	14	18	26
Intricate Pattern	101	1350	11	150	1290
TOTAL SAVING					\$2627

\* Based on labor at \$3 per hour.

tooling is plastic. And 90 pct of all their plastic tooling comes from epoxy resins. There's been startling growth in epoxy tooling during the past few years. One company, for instance, increased its 1953 outlay from a modest \$5000 to \$100,000 in 1958.

**Coming Boom** — Present consumption of epoxies in the auto industry amounts to 5½ million pounds per year. Looking ahead, one survey (compiled by Harvard students) predicts a 15 to 20 pct annual growth in epoxy tooling.

This same rate will be even higher as soon as other industries adopt epoxies for tooling, thereby following the example already set by auto and aircraft builders.

Plastic tooling costs less than conventional metal tooling. That's one of the main reasons for the widening use of epoxies. In many cases, the shorter operating life of epoxy tools is long enough for the job at hand.

Tooling resins with low shrinkage properties prompt accurate casting of intricately-shaped dies. Epoxies

insure a faster, less costly operation than steel dies.

It's true that the plastic material costs more. But these higher costs are far outweighed through savings in finishing labor and lead time.

**Into Tooling Field**—There are many examples in industry today where epoxies are replacing metals in tooling. They are being used in prototype or development draw dies. These dies are used for deep draws of heavy metals and for large compound-contour stampings.

Low-production draw dies with runs between 1000 and 10,000 stampings make use of a filled epoxy compound. Contoured punches and pads of epoxy are used with metal inserts, draw rings and blank holders in draw dies whose production runs between 10,000 and 50,000 stampings.

Even in the higher 50,000 plus runs, epoxies draw the more easily-formed metals, such as 0.025-in. brass.

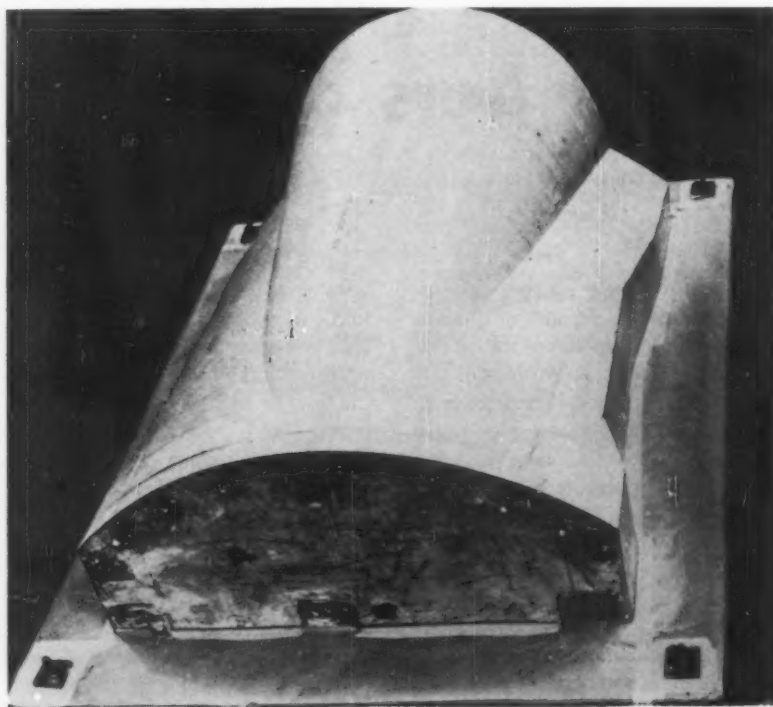
The industrial list covers flanging, trimming, re-strike and secondary operational dies. In hydroform and rubber pad forming dies, epoxies are useful to make large castings. They also provide abrasion-resistant surfaces that will not scratch the softer metals.

**Many Kinds of Dies**—They lend sharper radii to stretch dies, too. Epoxies are finding use in fixtures and gages, especially where mass casts are needed. Sometimes it's a question of better resistance to wear and abrasion.

Epoxies helped an appliance manufacturer build a draw die for prototype and advance engineering. The designers didn't know ahead of time what the radii and contours for proper internal action would be.

Starting with a clay model, they made a casting plaster model. They then set this into a mild steel weldment with draw ring attached. Next, an epoxy resin was cast over the plaster model to a thickness of ½ in. They were then able to cast a punch plaster pattern from the plastic cavity.

By cutting the plaster pattern



CIBA Products Corp.

**FOR AIRCRAFT USE:** Epoxies are used for spline master and drill fixture for door openings in U. S. Air Force Voodoo fighter planes.

down, it was possible to cast an iron core with a  $\frac{3}{8}$ -in. clearance. The die was to run without metal clearances. So the clearances were filled with a flexible epoxy.

**Little Wear**—How well has the die performed? About 400 pieces have been drawn so far and there are very few signs of wear. Drawn parts are 18-gage porcelainizing material, 22 in. square and 5 in. deep. Part dimensions are perfect. This die cost \$2250, weighed 1200 lb and required about 90 man-hours to produce.

Foundries are beginning to use epoxies more and more. They make good patterns, core boxes, core driers, core prints and match plates. Although in-roads into foundries to date have been slight, the handwriting on the wall indicates a great potential for epoxies.

Suppose the average foundry wanted to make patterns from epoxy resins. The necessary equipment could be acquired for as little as \$250.

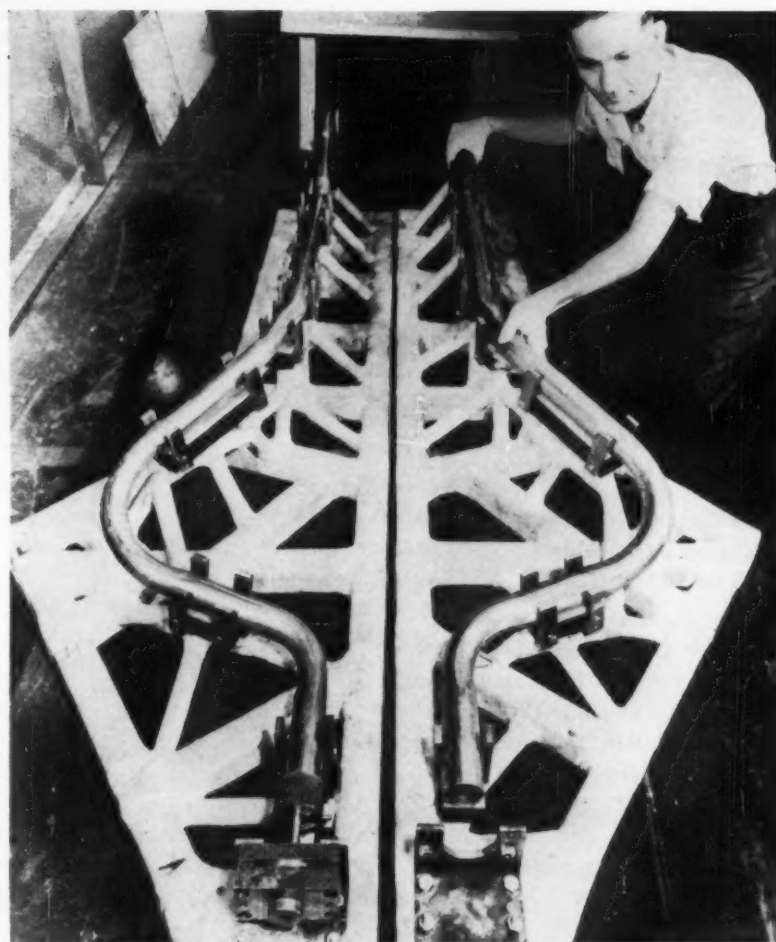
To a degree, taxpayers are reaping the benefits of epoxies. One military project spent \$250,000, waited 15 weeks, then received the 35 dies it had ordered. Formerly, the same number of dies in metal cost the government \$2 million. And the waiting period was 18 months.

**Maintenance Aid** — Industrial maintenance is beginning to lean toward epoxy resins, too. Between 10 and 12 million pounds of these resins are applied each year in coatings and paints to resist chemical attack and physical abuse.

Epoxy coatings stand up very well against corrosion. Proof of this can be pointed out by the experience of three companies.

A large chemical company is now saving \$4500 by using epoxies. The areas of saving include coatings on steel tanks, the repair of building roofs that cover solvent-discharging vents, and coatings of exterior insulation over pipes.

In another plant the cost of replacing 20-in. diam stainless impel-



Union Carbide Plastics Co.

**FIXTURING TAIL PIPES:** The automobile industry finds the answer in epoxies as a checking fixture for modern tail pipes.

ler blades on exhaust fans was \$120 each. These blades, subject to acid fumes in a steel processing plant, had to be changed every three months. Mild steel blades, covered with an epoxy fiber glass mat, show no corrosion after 18 months.

**Cleaner Containers** — A soap maker replaced its stainless tanks with carbon steel tanks lined with an epoxy compound. In doing so, the cost per square foot dropped from \$15 to \$4. This same company is also saving \$60,000 by using epoxy linings in several old kettles that are being renovated for detergent processing.

It's an endless list of proven applications where epoxy resins are giving quality performance at less cost. They may take the form of

adhesives or laminates, or even as potting compounds for electronic devices.

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**Acknowledgment** — The above article is based on a research study written by the author and eight other graduate students, while attending the Harvard Business School. The report is entitled, "Epoxy Resins: Market Survey & Users' Reference." It was published in July 1959 by Materials Research, Cambridge, Mass.

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**Reprints** of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



# Reduce Carbide Segregation In High Speed Steels

By Joseph Field—Ass't Metallurgical Engineer, Bethlehem Steel Co., Bethlehem, Pa.

**Carbide segregation is a normal occurrence in high speed steels. If severe, it can lead to premature failure of tools.**

**Research points out ways to minimize this problem.**

■ The ultimate goal in the production of high speed steel is to get a product with the least amount of carbide segregation. The area of interest is all-inclusive—from the selection of raw materials to the final annealing of the wrought product.

Some carbide segregation can be

tolerated. But it is generally conceded that the presence of large, massive carbides on the cutting edge of a tool can lead to premature failure.

**Need Proper Design**—All phases in the production of high speed steels are important. However, the real control of carbide distribution involves getting the proper ingot design, and subjecting it to enough hot-reduction to break up the as-cast structure.

There are some recent findings in regard to the use of inoculants. But first let us review some of the basic factors affecting the ingot phase of high speed steel.

In conventionally cast steel, freezing follows a well recognized pattern. The first metal to freeze on contact with the mold walls and bottom stool consists of a thin skin of relatively pure metal.

**Lead to Segregation**—Subsequent freezing, as it proceeds inward from the mold wall and upward from the bottom stool, results in solute elements being deposited ahead of the solid-liquid interface.

The entrapment of these solutes, and the enrichment of the last metal to solidify give rise to the familiar segregation pattern found in all highly alloyed steels. It usually occurs at the center and upper portion of the ingot.

Alloy content governs the amount of carbide segregation which may be present in the steel. But the distribution of these segregates are affected by the time it takes to achieve complete freezing of the ingot.

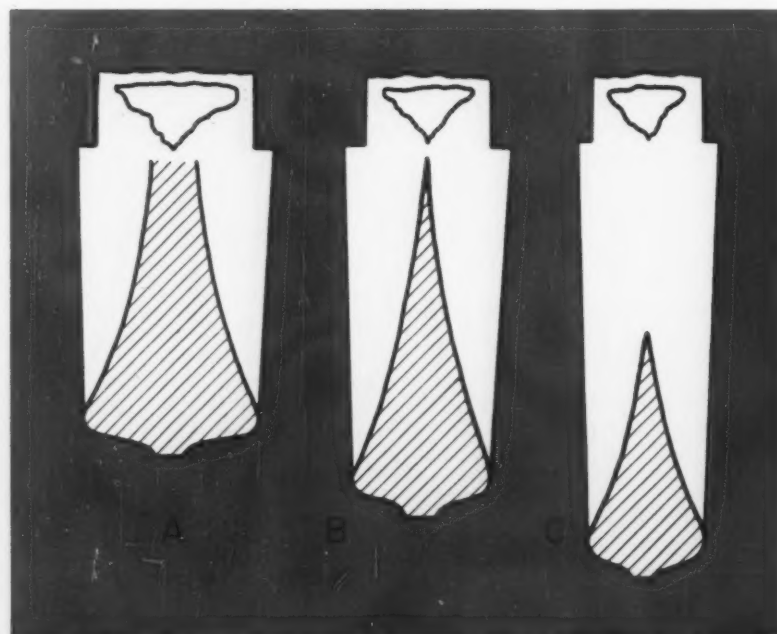
**Affect Rate** — Factors affecting freezing are casting temperature, ingot mold design, and ingot cross-section.

High casting temperatures allow the steel to remain molten for a longer time; these slower solidification rates produce coarse, axial segregation.

Low casting temperatures, however, give faster solidification rates; and the segregates will be more uniformly distributed.

**Prefer Short Molds**—What about mold design? Benefits to be derived are well covered in the literature. Early work by L. H. Nelson in 1934 on dumped ingots<sup>1</sup> has established the importance of the width-height ratio of the ingot.

## Mold Shape Affects Structure



**PUSHES TO TOP:** Short molds favor vertical solidification (shaded area). This desirable type of freezing pushes segregates to ingot top.



Short, stubby ingots allow freezing from the bottom of the mold as well as that which occurs inward from the mold walls. This type of freezing (vertical solidification) permits the segregates to reach the top of the ingot rather than gather in the lower portion.

**Freezing Modes Compete**—The linecut from the work of M. Nepper in 1954<sup>2</sup> shows the mode of freezing of three types of ingots. In the short, stubby ingot, vertical solidification predominates. A narrower and longer ingot permits the two types of solidification to reach the ingot top simultaneously. The long, thin ingot pinches off vertical solidification; transverse freezing rules.

Recent work at Bethlehem Steel points out the beneficial effects of short molds for high speed steels. Longitudinal slabs, 0.20-in. thick, and containing the metallurgical center, were taken from split ingots.

The top photograph shows two 18-4-1 high speed ingots prepared in this manner. Note that the shorter ingot contains less porosity and less of the gross carbide segregates.

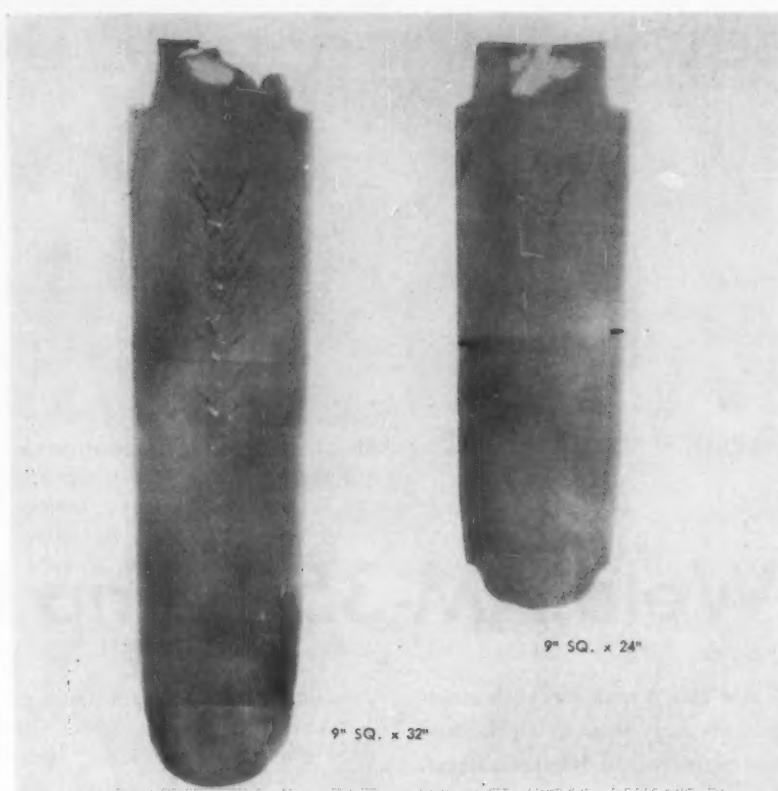
**Add Nucleants**—In recent years, steel men have tried to modify the normal solidification habits of molten metals by the addition of nucleants.

When these nuclei are of the proper size and crystalline structure, they act as centers for solidification. The rate of freezing is thus proportional to the number of these centers.

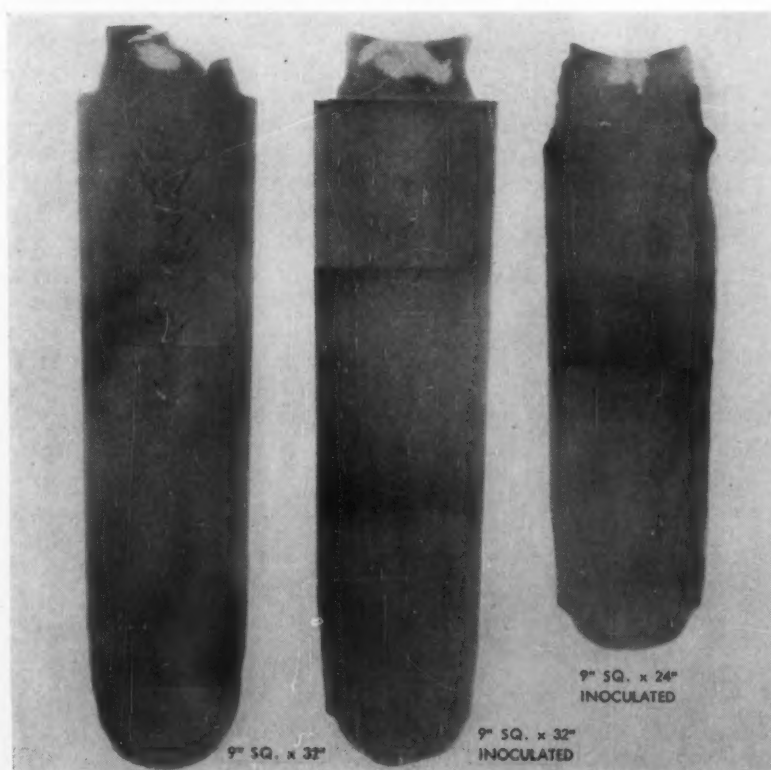
**Improve Distribution**—Results of development work carried out at Bethlehem Steel (covered by U. S. Patent #2,809,09), indicate that nucleants change normal solidification traits; this leads to improved carbide distribution.

Thus carbide segregation in high speed steels need not be a problem. Just pour into short, stubby molds at relatively low temperatures, and add nucleants.

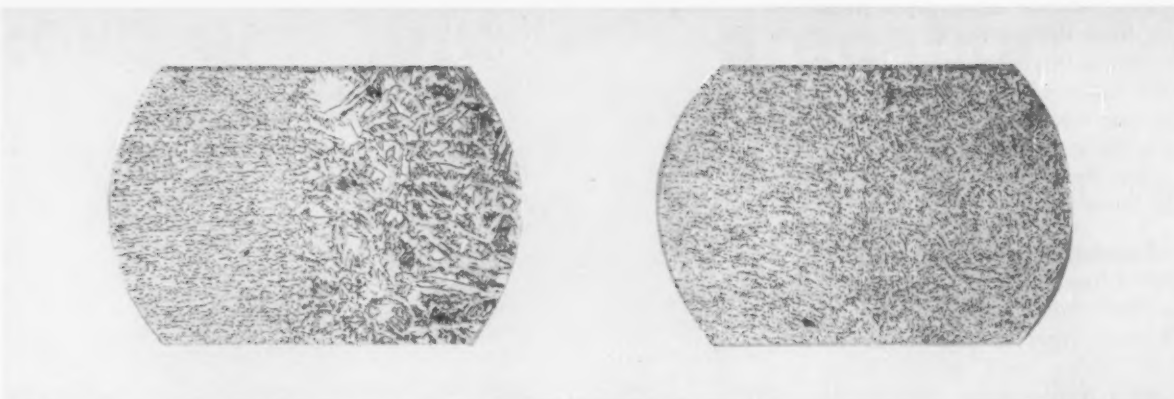
REFERENCES: 1. L. H. Nelson, "Solidification of Steel in Ingot Molds," Trans. ASM, 1934, pp. 193-226. 2. M. Nepper, "Contributions to the Study of Heterogeneity of Forging Ingots," Steel Processing, Oct. 1954.



**SHOWS LESS DEFECTS:** Shorter ingot has less segregation and porosity.



**IMPROVES STRUCTURE:** Two radiographs on left point up beneficial effects of nucleants on ingot structure. Radiograph on right shows that an even better structure is obtained when a short mold is also used.



**REFINE STRUCTURE:** Annealing AM-350 changes as-welded structure (left) to homogeneous structure (right).

## Weld AM-350 Strip Into Tubing

**AM-350, a high strength stainless steel, is now being formed and welded into tubular shapes.**

**Key to the success is the close control over drawing and annealing techniques.**

■ AM-350, a relatively new member of the stainless steel family, is gaining in popularity for high strength uses—particularly in the aircraft industries.

Recently, this alloy was added to the list of stainless and special alloy welded tubing produced by the Wallingford Steel Co., Wallingford, Conn.

In the solution annealed condition, the alloy has the ductility traits of austenitic stainless steel; when hardened it has the high

strength and corrosion resistance of a martensitic stainless steel. The alloy also possesses brazing characteristics comparable to the austenitic stainless series.

**Form and Weld Strip**—AM-350 strip is formed and welded by the tungsten inert-gas arc welding process on Wallingford's continuous welding lines. The tubes are drawn to finish size in a series of drawing operations: Each step calls for a minimum 40 pct reduction followed up by an intermediate anneal.

The drawing and annealing methods established by Wallingford's engineers eliminate the cast structure of the weld, and result in a weld area that is almost indistinguishable from the base metal. As a result, the weld area undergoes full response to the hardening treatment.

**Control Temperature**—The basis for the heat treatment of AM-350 lies in close control of the  $M_s$  temperature. Annealing above 1800°F results in an  $M_s$  that is below room temperature, thus the alloy is austenitic at room temperature with very good forming and welding characteristics.

Condition annealing at 1710°F causes some carbide precipitation; this raises the  $M_s$  temperature slightly above room temperature. Subsequent sub-zero cooling to -100°F results in almost complete transformation to martensite; thus, the alloy has the high strength properties associated with martensitic steels.

Optimum tensile properties are achieved by tempering at 850°F following the sub-zero cooling treatment.

Wallingford, a subsidiary of Allegheny-Ludlum Steel Corp., originators of the alloy, is presently making AM-350 tubing in sizes ranging from 3/16 OD (with wall thicknesses from 0.010 to 0.049 in.) to 3 in. OD (with wall thicknesses from 0.025 to 0.120 in.).

The company is currently offering the tubing in any of three conditions: solution annealed, hardened, and cold-drawn and tempered.

### Properties of AM-350 Welded Tubing

Condition	Yield Strength, psi	Tensile Strength, psi	Elongation, pct
Annealed	70,000	160,000	40
Hardened	175,000	205,000	20
Cold-drawn and tempered*	175,000	191,000	30

\* Properties are for 25 pct reduction. Various strength levels can be obtained by decreasing or increasing the amount of cold reduction.

# Giant Plate Stretcher Improves Properties of Aluminum Alloys

**There's a lot behind the idea of stretching a 60-ft plate into a 64-footer.**

**A 150,000-ton machine does it, making aluminum alloy's easier to weld and heat treat.**

■ The demand for aluminum plate increases daily. It's becoming more popular in transportation, ship-building and aircraft. But in order to undergo further processing, aluminum should be prepared so that subsequent welding or heat treating be problem-free.

The best way to achieve such a condition in aluminum plate is in refining the internal structure. This tends to equalize the distribution of stresses, giving the plate the desirable properties needed.

It takes a big setup to attain these goals. No one knows that better than the personnel at the Ravenswood Works of the Kaiser Aluminum & Chemical Corp., Ravenswood, W. Va. Here, they're using an aluminum plate stretcher that weighs 30 million lb.

**Big and Powerful**—The largest in the world, this stretcher can grip the ends of a 60-ft long plate of high-strength aluminum alloy and lengthen it as much as 4 ft.

This giant machine can stretch maximum cross sections of 640 sq in. And it handles thicknesses up to 6 in., widths up to 160 in. and lengths from 17 to 60 ft.

Built for Kaiser by Hydraulik G.M.B.H., Duisburg, Germany, the stretcher is installed in a heavily-reinforced concrete pit 120 ft long, 32 ft wide and 15 ft deep. The top of the machine rises 8½ ft above floor level.

There are four huge head cast-

ings in the unit. Each one weighs 132 tons. The entire machine possesses about twice the power of any other stretcher in operation.

**Riding the Tracks**—The machine is without a guiding frame. It's free to move on its foundation-supported tracks. Each head is supported on each side by eight special railway car wheels on a double track.

Shock absorbers between the ends of the pit and the columns prevent the plate from fracturing while it's being stretched.

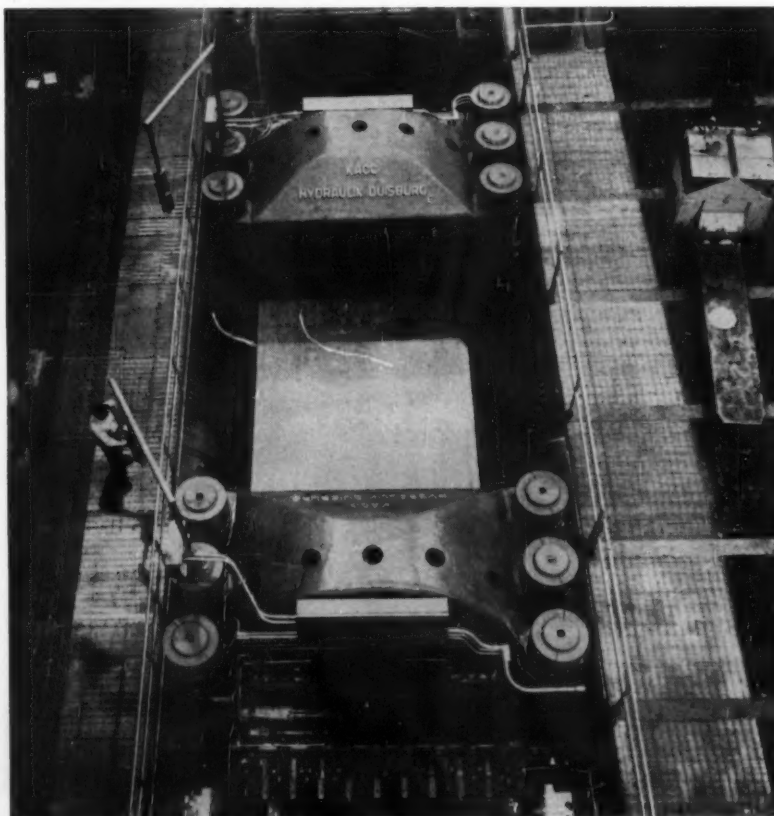
The stretcher jaw setup also includes a hydro-pneumatic system

similar to the recoil device in a heavy cannon. As a result, it can absorb over 15 million ft-lb of energy in each head.

The parts that make up the stretcher are huge in their own right. Each completed cast steel head weighs 906,000 lb, while each of the two columns tips the scale at 145,000 lb.

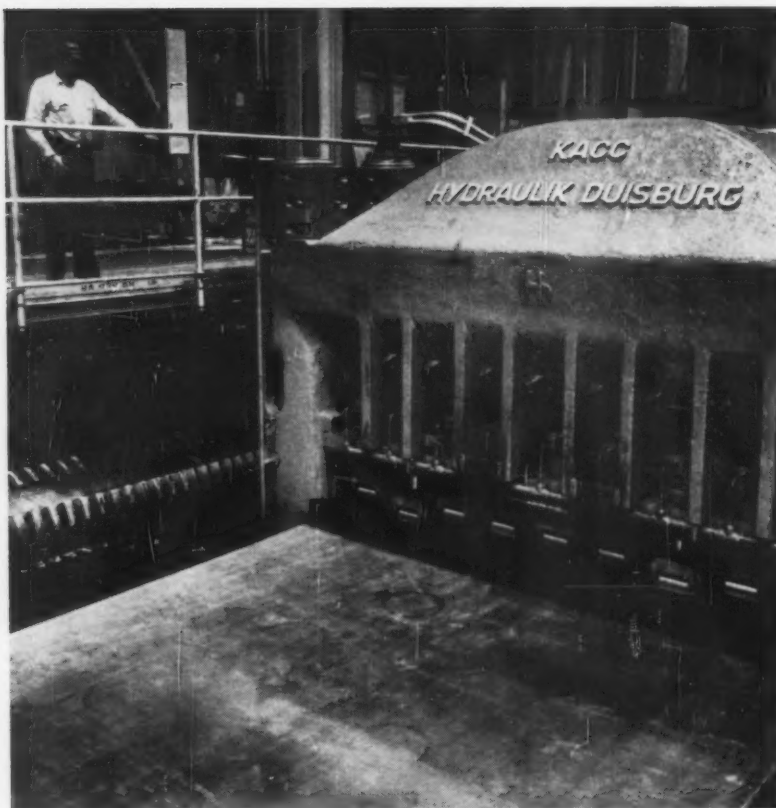
**Better Welding**—In providing a more uniform distribution of stresses in aluminum plate, the machine is expected to be a particular boon to the welding industry.

The improved qualities of aluminum plate should provide even

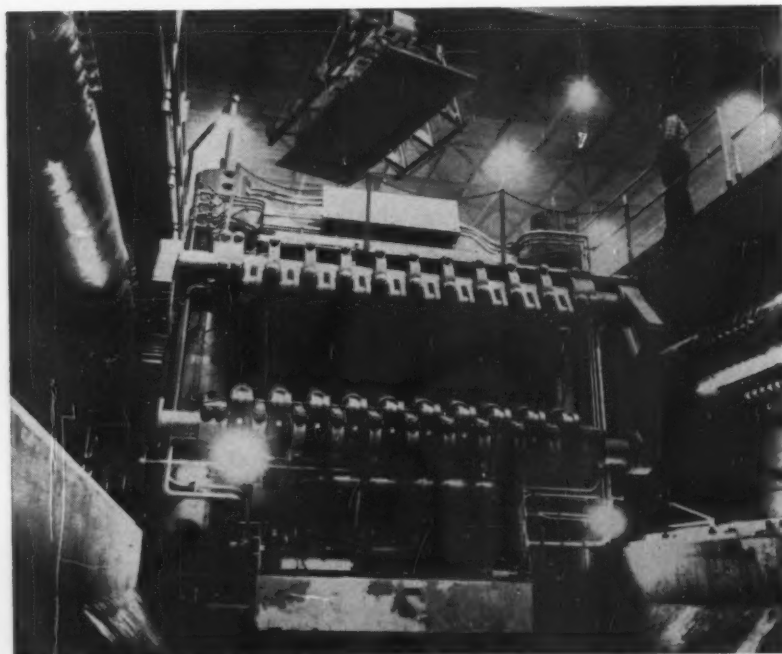


**IMPROVING THE PROPERTIES:** As the 150,000-ton machine stretches the aluminum plate, it refines the internal structure of the metal.





**STRETCHING POWER:** Gripping heads at each end of the machine are composed of a top and bottom part, each of them weighing 132 tons. Its power is almost twice that of any other stretcher in operation.



**STRONG FOUNDATION:** Soil under the foundations of the 3,000,000-lb machine has a bearing value of 6000 lb per sq ft. The foundation itself contains 2200 cu yd of 3000 psi Pizzolith concrete.

more widespread use of welding in marine construction, the chemical process and petroleum fields (for tanks and process equipment) and railroad equipment.

It will also be useful to fashion ballistic armor plate in the newer lightweight U. S. Army vehicles. Another booming area where aluminum alloys enjoy wider usage is the field of processing, storage and transportation of liquid methane, oxygen, nitrogen and hydrogen.

The stretcher itself has a stationary head at one end. Another head at the other end moves along rails. This head is guided by two horizontal, parallel, circular columns. Made from forged steel, these columns are 42 in. in diam.

Each column is actually divided into two columns, each 35 ft long. In between these columns is a large stretching cylinder that runs at a hydraulic pressure of 6000 psi. Both columns are hollow. One of them also acts as a manipulating cylinder.

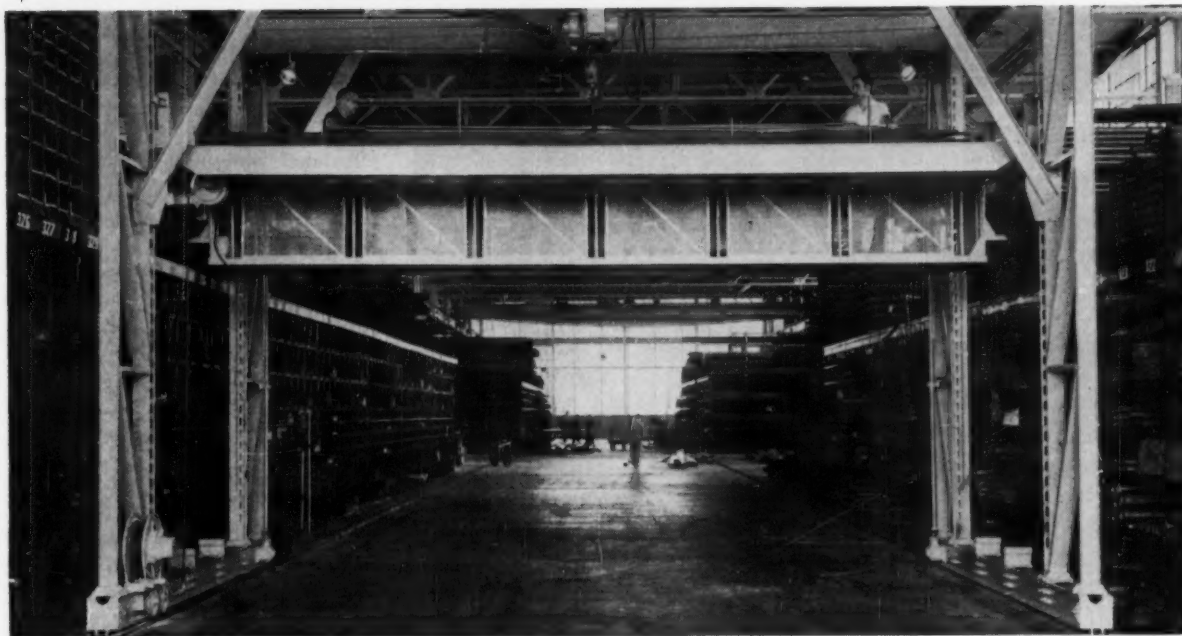
All foundation, mechanical and piping work was done by Henry J. Kaiser Construction Co.

**The Vital Link**—Work and materials had to perform at their very best during the installation of the huge machine. And grouting was one of the most important phases. Without proper grouting between the machine and the foundation, there would be no operation at all.

Field engineers from The Master Builders Co. helped the eight-man construction force complete the grouting operation in two days. This was accomplished under pressure. March weather in West Virginia fluctuates. They worked during a brief period when the weather was normal. The whole job consumed a total of 10 cu yd of Embeco grout.

Coupled with the useful effects of heat treating and ultrasonic testing, the stretcher should help furnish a welcome improvement to heavy industry—the strongest aluminum alloys available in larger and thicker plate sections.





**LOADING UP:** Stock is picked up from sections on either side of the aisle at the same time. Warehouse

personnel pull the material out of the pigeonholes, and place it on the stock table.

## Mobile Unit Saves Handling Time

**Materials handling can be a tough job—or it can be quick and easy.**

**The operators of a new mobile handling system ride to work—with tools always on hand.**

■ Take any pigeonhole or compartmented storage system. Add a traveling lift platform and an overhead electric hoist. Next, install a cut-off saw on the platform. . . . You now have the answer to a tough handling and storage problem that faces many steel warehouses today.

Using such a device, stock racks become easily and quickly accessible to warehouse personnel. The stock can be picked up from either side of the aisle. In fact, both sides can be worked at the same time.

**Rush Special Sizes**—When short lengths are required, the operator brings the platform to the proper

pigeonhole. He removes the material and cuts the piece to size, using the cut-off saw located on the lift platform.

The remainder of the stock is then returned to the rack. This eliminates the need for taking the material to a distant cut-off saw. It also does away with traveling back to replace the rest of the stock in its storage compartment.

The entire mobile unit is self-supporting. Operating on rails that are flush with the warehouse floor, and under control of an operator who rides with the platform, it travels the entire length and height of the storage bins.

**Up We Go**—Elevation of the lift apparatus allows the operator to reach the upper racks—and also clears the aisle below for passage of fork trucks, personnel, etc. The stock table remains waist-high in front of the men, even when the platform elevation is changed.

An electric hoist is arranged for lateral movement, on a beam over the center of the platform. This speeds the transfer of materials from the table to the fork trucks.

Safety interlocks on the electrical controls prevent the platform from being moved against any stock left projecting from the racks.

**Immediate Delivery**—The Service Steel Co., Detroit, a div. of the Van Pelt Corp., carries more than 1500 types and sizes of pipe and tubing, in pigeonhole storage racks. Using their new, ceiling-high, storage system and the mobile stock handling platform, they provide immediate delivery—despite a wide variety of size requirements.

Engineering details and actual construction were handled by the Chicago Tramrail Corp., Chicago.

Although this new method of warehouse handling has been in effect a relatively short time, it has already proven satisfactory.

# Pin Many Jobs on Special Units

**Instead of letting special machine tools gather dust when they've done their work, a few extra features can put them to work on a variety of tough jobs.**

■ If sufficient thought is given to planning, specifying and designing some extra features for a special machine, the added effort and cost will be well rewarded in utility. Such plus items pay off in setup as well as machining savings. It also can lead to cutting out subsequent assembly operations or previous hand work.

That's been the experience of Baker Perkins, Inc., according to R. C. Rieder, vice-president, who coordinates production operations of the Saginaw, Mich. company's food and chemical machinery divisions.

Installed in the machine shop is a new 40-ft Cincinnati horizontal spiral milling machine. It was planned primarily to handle machining of stainless steel mixing screws in lengths up to 24 ft, diameters of 16 in.

**Speeds Production** — Although only in operation eight months, the machine has already reduced man-hours on special mixing screws by better than 40 pct. This includes both machining and assembly floor operations.

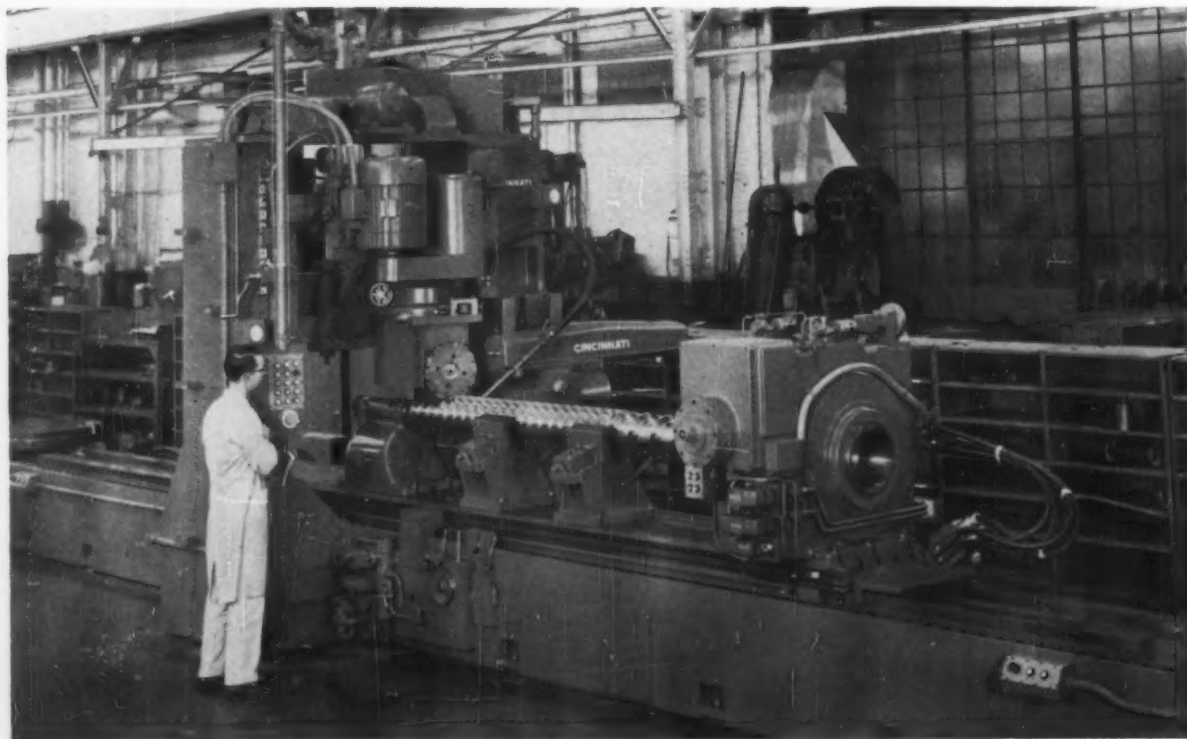
While earning its keep by performing its primary job better and faster, the unit also justifies its cost on a variety of other tough-to-handle parts.

Furthermore, the machine can perform straight milling operations. These jobs include keyway cutting or slotting long shafts, both on

scheduled time and for overflow. In the extra work, the machine's advantage is greater accuracy and faster setup time.

**Mills the Helix** — The machine, however, was especially designed to mill the helix on the long steel and stainless steel mixing screws. These are used in a continuous process mixer — a unit built in various capacities by the Chemical Machinery Div. to process such diversified products as plastics, solid rocket fuels and propellants, adhesives, food products, dyes, carbon electrodes and friction materials.

Depending on mixing capacities, screws for these mixers range from 4 to 24 in. diam. and include screw sections up to 24 ft long. They call for a cut to produce a double-lead, interrupted-flight screw.



**HARD JOBS ARE EASY:** Special milling machine with 30-ft bed mills chemical and food mixing screws.

Extra facilities allows unit to handle a variety of tough jobs, as well as handling standard milling.

The screw mounts in a barrel, lined with three rows of teeth. When the mixer operates, the screw rotates and reciprocates in the barrel at the same time.

**Need Close Tolerances** — The teeth in the barrel or chamber actually pass through the interruptions of the screw thread. It takes close machining tolerances to allow clearances for thread segments.

Previously, it used to take the shop about 80 hours to produce an 8-in. diam screw. This included building up the core by welding stainless or steel castings in shape of thread segments to the body, then machining.

It also took about 65 hours additional to hand grind the flights for proper clearance between the teeth of the cylindrical barrel. Grinding of larger diameter screws ranged up to 90 hours.

**Saves Hard Work**—Now, through use of the new special machine, an 8-in. diam screw is ready for assembly after a total of 90 hours work. Much of the savings is in the hand finishing and fitting time.

Materials used for screws range from 1035 steel to 316, 17-4 PH and 304 stainless steel. Today they are delivered in the form of bars, so machining can be done from solid stock.

Screws of 10- to 16-in. diam, however, still require some pre-fabrication, that is building up of thread segments starting from a 10-in. diam solid. But the new setup eliminates grinding to knock off about 65 hours of work on the assembly floor.

**Special Features**—The miller includes a heavy-duty universal spiral milling head, which can be swiveled 20° on either side of the cutter. This head accommodates cutters up to 16 in. diam. High-speed steel cutters usually are used, with cutting speeds ranging to 40 fpm.

The milling machine is set up to mill the leads on kneading screws by means of a special type work



**TOUGH SETUP:** Stub screw for radial pelletizer goes through varied machining from 33-in. long bar, 1035 steel stock of 8 in. diam.

holding fixture. This is arranged with synchro connections through the machine.

Bed of the machine is about 30 ft long. The saddle, which is mounted on the bed, houses the drive mechanism for longitudinal travel. Also mounted on the saddle is a column to provide vertical travel of the spindle carrier. There are 19 spindle speeds, ranging from 22½ to 1800 rpm.

**Varied Setup**—The work holding fixture holds the work pieces between centers. Or the spindle nose can be changed to hold a three-jaw chuck. This is for long-thin workpieces able to fit inside the spindle.

A horizontal spindle with its own separate 20-hp motor mounts at right angles to the main table. It has a vertical adjustment range of 22 in., with a positive stop for setting to depth. Fixturing includes a heavy-duty indexing and spiral milling unit equipped with a four-

jaw chuck and hand-operated center type tailstock.

The entire machine including the fixture is connected by a synchro arrangement through which fixture rotation controls the table movement to produce the desired lead.

**How It Works**—To machine a screw, like the 2½-ton, 16-in. diameter unit with welded-on thread segments, you use the horizontal spiral milling head for roughing. Finish and relief cutting are done with a high-speed steel end-mill, mounted in the horizontal spindle.

Tool geometry on the milling cutter for roughing is 45° positive, 1/16-in. radius. The two-lip and spiral mills employed have a range of 2° to 22° on the side with radii ranging from ⅛ to ½ in.

On the spiral screws, tolerances are generally to within 0.005 in. on OD of the interrupted flights. In addition there's a requirement of 0.0025 in. total tolerance on the sides of the screws.



# Convert Chips Into Castings

## Low Cost Melting of Scrap Spurs Use of New Induction Unit

**New design permits use of induction melting where cost once was a handicap.**

**One useful area is in the reclaiming of chips, turnings, and borings.**

■ Companies which make lots of chips during metalworking will be interested in a new type of induction power source.

They can now convert—rather than sell—their chips, turnings, and borings into usable ingots.

Costs are competitive with other foundry methods. Estimates for metal at the spout are: Less than 2½¢ a pound for malleable and gray iron; less than 7½¢ a pound for stainless steel.

**Reclaims Many Metals**—Called the Multiductor, the unit, developed by Ajax Magnethermic Corp., can reclaim steel, stainless steel, brass, copper, aluminum, and cast iron scrap.

Objections to induction melting usually include these: "The foundry is no place for a rotating-type generator," or "The unit is too expensive." The design of the Multiductor, however, vetoes both these criticisms.

It uses a static device for frequency conversion; this automatically lowers the cost. Moreover, there are no moving parts, rotating items, or bearings to wear out or become clogged by foundry dust and dirt.

The Multiductor has all the ad-

vantages of induction units. Melting is fast and clean; there is little time for oxidation; metal and heat losses are low; stirring action gives uniformity in the ingots.

**Simple Operation** — Converting chips and turnings into ingots of uniform quality is a straightforward job. The charge for the first heat in a cold furnace should consist partly of pigs and buttons. The reason for using the pigs is to insure efficient power input into the furnace at the beginning of a heat.

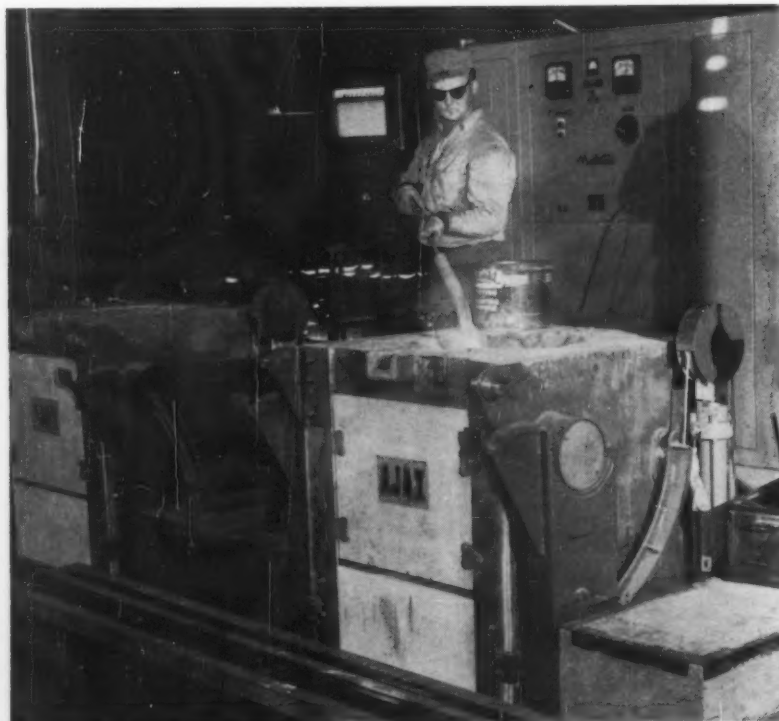
A molten pool develops soon after full power is applied. There is a rolling action in the molten bath because of the low 180 cycle frequency. This action pulls the chips down into the melt before oxidation occurs.

As the melt progresses, more chips are added. They also fall into the melt without prodding or rodding.

**Can Take Analysis**—Here is where another advantage of induction melting comes into play. Since losses in carbon, silicon, and manganese are predictable, additions of graphite or ferroalloys can be made at this point. If desired, a sample of the melt can be taken for quick analysis before alloying.

After completion of the melt, about ¾ of the volume should be poured off, recommend Ajax engineers. The remaining metal serves as a heel in order to start the next melt; it also insures a high level power input.

Multiductors range in rating from 100-1000 kw. The smallest unit has a range of furnace sizes from 500-1000 lb. It has a predicted melting rate for iron of 400 lb per hr. The melting rate for the largest unit is 2 tons per hr.



**MELTS CHIPS:** Making ingots from chips need not be a "hit-or-miss" operation. A Multiductor allows sample taking, and alloying if necessary.



## FREE LITERATURE

Money-saving products and services are described in the literature briefed here. Publications are free with no obligation. Just circle the number on the free postcard and mail.

### Special Alloys

Technical data bulletins list specifications of special alloys and detail the metals processing services offered by a company. Alfenol, Havar, and Elinvar Extra are discussed, as well as magnetic alloys and close-tolerance processing of ultra-thin foil to specification. (Precision Metals Div., Hamilton Watch Co.)

For free copy circle No. 1 on postcard

### Program Controller

A four-page data sheet describes the operation of a master-slave program-control system for use where temperature uniformity is critical. It has proved itself in the brazing of stainless-steel honeycomb panels for aircraft and missiles. (Leeds & Northrup Co.)

For free copy circle No. 2 on postcard

### Fasteners

Production facilities, plants, and products of the new Fasteners Division of a company are illustrated and described in a 12-page brochure. A complete line of mechanical fasteners and special cold-headed parts is offered. A consulting service is available. (Engineered Fasteners Div., Townsend Co.)

For free copy circle No. 3 on postcard

### Flame-Plating

Flame-plating — heating metal particles to a plastic state and blasting them on materials as coatings — is described in a four-page bulletin. The resulting coatings are well bonded, dense, and hard. General properties of such coatings are discussed, and tables of physical data

are provided for the coating materials most often used. Typical applications are listed. (Linde Co.)

For free copy circle No. 4 on postcard

### Acetylene Generator

An acetylene generator is designed specifically to accommodate newly available carbide ranging in size from 2 in. to dust. A worm-screw feeding device enables the use of this material. The unit is described in a four-page brochure. (The Sight Feed Generator Co.)

For free copy circle No. 5 on postcard

### Welding Practice

"Causes and Cures for Hot Running Welding Cables and Connections" is a bulletin containing a wealth of information on how to maintain welding equipment and electrical connections for most efficient performance. (Tweco Products, Inc.)

For free copy circle No. 6 on postcard

### Basic Oxygen Steel

A major technical advance in steelmaking — the production of basic oxygen steel — is outlined in a 16-page booklet. The method has the advantage of being extremely fast — 1/2 hour for a melt instead of 10. (Kaiser Steel Corp.)

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### Superalloys

Performance data on vacuum-induction-melted Waspaloy and M-252 superalloys are presented in two eight-page bulletins. These are high-temperature, high-stress superalloys presently being used in jet, missile, electronic, and nuclear applications. (Kelsey-Hayes Co.)

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### Hydraulic Presses

Single-, double-, triple-, and quadruple-acting hydraulic presses are described in a brochure. They're for rubber, plastic, and ceramic forming, crushing, laminating, dehydrating, pelletizing, vulcanizing, and other compression uses. With heat of platens exactly controlled,

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## FREE LITERATURE

they provide staggered curing cycles and a straight-line flow of work, and require only one operator. (Allied Engineering & Production Corp.)

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## Radial Drill

A six-page bulletin describes the Burgmaster Model 2 BR turret-type radial drill. It features power indexing, automatic clamping, and depth control to 0.002 in. (Burg Tool Mfg. Co., Inc.)

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## Tab-Weld Resistors

A four-page bulletin describes a line of tab-weld resistors, and shows how they contribute to minimum maintenance. (The Electric Controller & Mfg. Co., Div. of Square D Co.)

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## Vacuum Uses

A folder tells how a line of vacuum equipment is used to reclaim, process, and convey scores of materials. Typical applications described include pneumatic conveying, cleaning boiler tubes, and removing used coolant from machine sumps. (Invincible Vacuum Cleaner Mfg. Co.)

For free copy circle No. 12 on postcard

## Progressive Press

Detailed operating features and specifications for a press for progressive stamping are given in a six-page bulletin. It is a vertical four-slide machine with an integral stock straightener. (The Torrington Mfg. Co.)

For free copy circle No. 13 on postcard

## Oiltight Switches

Two new oiltight, maintained-contact yoke-actuator switches are sealed with O-ring seals, neoprene rings, and sealed conduit. The actuator causes the internal switching unit to transfer when a reciprocating member must operate the switch when moving in one direc-

tion and reverse it when moving in the other direction. A data sheet describes them in detail. (Micro Switch.)

For free copy circle No. 14 on postcard

## Aluminum for Welding

Where and how to use aluminum for welding, brazing, and soldering is the subject of a series of charts. Recommended joining materials and operational procedures are covered for 24 aluminum alloys. (All-State Welding Alloys Co., Inc.)

For free copy circle No. 15 on postcard

## Jaw Crusher

Twenty-one modern operating advantages of a new jaw crusher are pointed out in a bulletin. Among the features stressed are heavy-duty construction, low maintenance, high capacity, and low power consumption. (Allis-Chalmers)

For free copy circle No. 16 on postcard

## Air-Power Stapler

A bulletin describes an air-power stapler featuring improved stapling quality and speed. Operating off regular shop air, it permits continuous high-speed production-line stapling. (Paslode Co.)

For free copy circle No. 17 on postcard

## Variable Sheaves

Variable-speed sheaves of a new series have a resilient cam-follower design that eliminates freezing and sticking. They will hold a constant driven speed under varying torque loads. They're covered in an eight-page bulletin. (T. B. Wood's Sons Co.)

For free copy circle No. 18 on postcard

## Delaware Valley

A 24-page booklet outlines the economic benefits the ports of the Delaware River bring to the citizens and communities of the Port Area. Eleven counties in Pennsylvania, New Jersey, and Delaware were surveyed. (Port Development Dept., Delaware River Port Authority.)

For free copy circle No. 19 on postcard

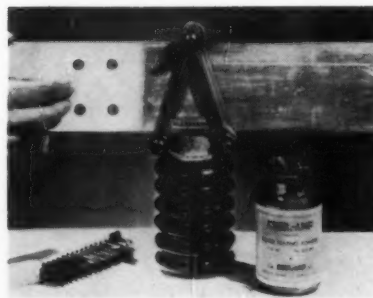
# New Materials and Components

## Silver Powder Cuts Overheating at Connections

High amperage electrical connections can now be easily silverplated on the job with a special powder. It's considered equal to electroplating for protection against oxidation on bolted and stationary contacts. The coating minimizes overheating, giving maximum con-

ductivity for copper, brass or bronze contacts. It reduces maintenance and insures long life. There's prevention of small oxidation losses that add up to major power loss. About 6000 sq in. can be plated with 1 lb. (Cool-Amp Co.)

For more data circle No. 24 on postcard, p. 51

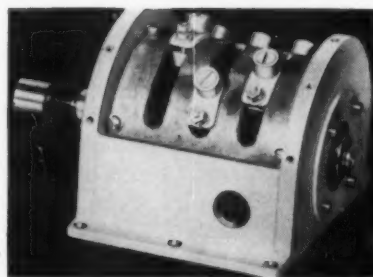


## Rotary Switch Gives Safe Control of Presses

A new rotary switch controls automatic cycling equipment. Having been successfully applied to punch presses, this unit is now being offered for use on similar applications. The switch shuts off the power at the end of each cycle and automatically starts the cycle unless

interrupted. The switch is connected to the solenoid which actuates the cycle. Cycling time is adjustable within limits. The basic unit is adaptable to any existing installation where cycling is required. (Superior Carbon Products)

For more data circle No. 25 on postcard, p. 51

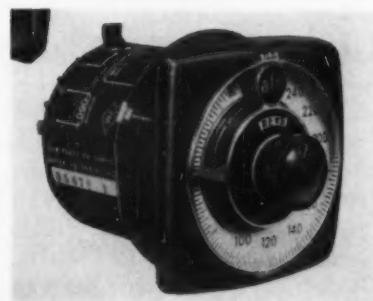


## Revolution Counter Controls Length Measurement

Accurate length measurement of wide materials, such as those in sheet form, can now be controlled by a new, miniaturized shaft-driven revolution counter. The device will count shaft revolutions up to 1000 rpm. It requires only 1¼ oz-in. torque for dependable electrical control of machine or system op-

eration. Repeatability is  $\pm 0.0025$  of dial range. Designed for surface or flush mounting, the counter has an electrically operated clutch which connects input rotation to the traveling dial pointer. Dials range to 240,000 revolutions. (Automatic Timing and Controls, Inc.)

For more data circle No. 26 on postcard, p. 51



## Switch Has Adjustable Roller-Lever Actuator

Suitable for operation by either fast or slow cams or slide actuating devices, an enclosed switch has a two-way adjustable roller-lever actuator. The unit comprises a single-pole double-throw precision snap-acting switch in die-cast aluminum housing with a sealed overtravel plunger. The actuator arm can be

adjusted through 240° around its shaft. The actuator bracket rotates about the plunger to any one of eight positions 45° apart. Two side-mounting styles and one base-mounting style are now available. (Unimax Switch Div., W. L. Maxon Corp.)

For more data circle No. 27 on postcard, p. 51

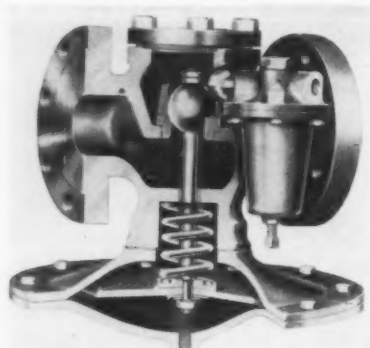




## DESIGN DIGEST

### Reducing Valve

A new external pilot operated steam pressure reducing valve meets all the requirements for use at most installations. Although extremely sensitive, its simple operation insures troublefree service. Pressure adjustments are quickly and easily made by turning the adjusting



screw on the pilot valve. It closes tightly for dead end service. An AISI type 440C stainless steel ball inner valve closes against a monel seat ring. This combination withstands wire-drawing effects of steam indefinitely. Valve sizes run from 3/4 to 4 in. (Klipfel Valves, Inc.)

For more data circle No. 28 on postcard, p. 51

### Resin for Finishes

Only pigment and water need be added to a new resin to get a ready-to-spray enamel. Solvents and driers are eliminated. Baked films show very good flow and leveling, high gloss, and clearer and brighter colors than solvent enamels with the same pigmentation. The resin is a melamine-acrylic formulation. Outdoor durability is on a par with that of the best melamine-alkyd finishes. Suggested uses are full color, pastel, and metallescent automotive and industrial finishes. (American Cyanamid Co.)

For more data circle No. 29 on postcard, p. 51

### Actuator Switches

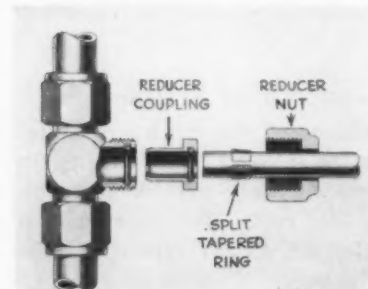
A line of switches now includes new one-way roller-arm and rod actuator versions. The roller-arm models provide electrical actuation in one direction only, and are avail-

able for either side or bottom mounting. They are designed for machine tools with a slide to actuate the switch and override it, but not actuate it on the return stroke. A sealed plunger protects the mechanism. The rod-actuated models are for use with counters, conveyors, and sorting devices. The rod can be cut or formed to meet individual requirements. Contact arrangement of both is single-pole, double-throw. (Micro Switch)

For more data circle No. 30 on postcard, p. 51

### O-Ring Couplings

The higher the pressure the greater the seal of the O-ring unit. That's the advantage of a line of reducer couplings in simplifying hydraulic, vacuum and pneumatic



systems. The setup consists of a standard fitting plus a reducer coupling with a nut and split tapered ring. It applies to tubing of any thickness and can be disassembled any number of times with all parts reusable. (Lenz Co.)

For more data circle No. 31 on postcard, p. 51

### Gear Pumps

A new series of gear pumps is designed for 3000-psi constant-pressure and 4500-psi intermittent-pressure service. They deliver uniform flow regardless of variations in fluid viscosity or load, and come in capacities of 5, 10, 15, or 30 gpm. Specials up to 100 gpm are available. These pumps are small in size and light in weight. Precision alignment is insured by needle bearings enclosed in one-piece bearing blocks, which will not misalign under loads. A rear floating bearing block is urged against the gear faces

by hydraulically actuated pistons. This arrangement automatically takes up wear and maintains zero end clearance. Specific mounting details can be provided to meet specific requirements. (Superior Hydraulics)

For more data circle No. 32 on postcard, p. 51

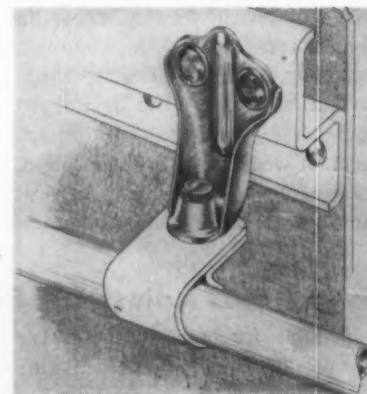
### Zinc Brighteners

Two new brightening agents for zinc plating are very stable, and provide effective brightening even after weekend shutdowns. Liquid form eliminates mixing, and simplifies control. They will tolerate wide variations in zinc bath formula. One produces a white, bright plate directly from the barrel, even without bright dipping. The other produces a bright deposit with a slight yellow cast from barrels, or rack plating tanks. Its fine-grain, uniform deposit produces a clear, bright plate after bright dipping. (Allied Research Products, Inc.)

For more data circle No. 33 on postcard, p. 51

### One-Piece Bracket Nut

Developed in cooperation with the aircraft industry, a new one-piece self-locking right-angle bracket nut saves space, weight and cost of wire conduit line supports. It's a replacement for a variety of attachment methods ranging from sheet metal brackets to direct bolting to structures. High resistance to



twisting and distortion cuts maintenance and damage caused by deflection under severe operating stresses encountered in airframe structures. (Elastic Stop Nut Corp. of America)

For more data circle No. 34 on postcard, p. 51



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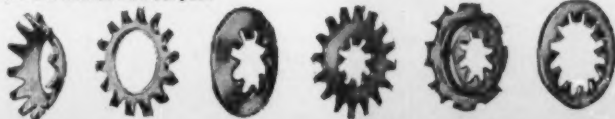
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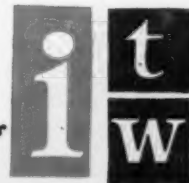
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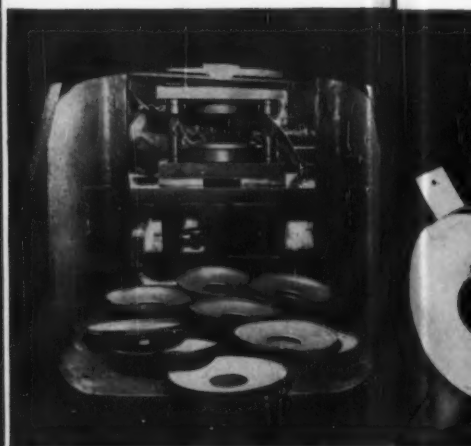
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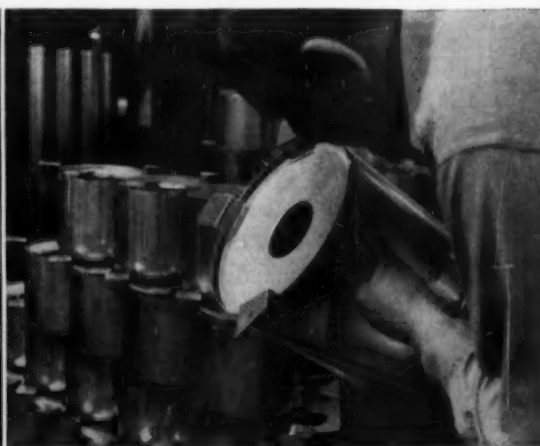
# American Furnace hearths now made of Stainless Steel

The hearth of an oil furnace may glow at 1500°F. American Furnace Company used to make their hearths from fire brick, and these hearths were usually installed after the furnaces were delivered to the customers.

The company finally switched to Stainless Steel hearths because Stainless Steel *simplified* fabrication. It could be quickly cut, rolled, drawn and welded into a hearth that could be installed right at the factory. And the Stainless Steel doesn't absorb or insulate the heat. It transfers the heat faster, so it increases the combustion efficiency of the unit. It's safer . . . won't absorb oil, and it *cools* quickly, so there's less chance of accidental fire or explosion in the furnace.

When *you* need a material that's corrosion resistant, strong at high temperatures, and not difficult to fabricate, specify Stainless Steel. And for service-tested quality, specify USS Stainless Steel. Call the nearest office of United States Steel or your local Stainless Steel distributor.

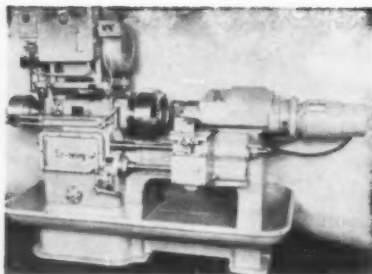
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United States Steel Corporation—Pittsburgh  
American Steel & Wire—Cleveland  
National Tube—Pittsburgh  
Columbia-Geneva Steel—San Francisco  
Tennessee Coal & Iron—Fairfield, Alabama  
United States Steel Supply—Steel Service Centers  
United States Steel Export Company

**United States Steel**

# New Equipment and Machinery

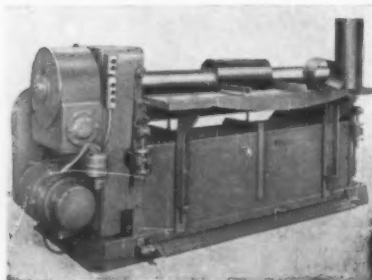


## Turn, Face, Drill, Ream, Groove at Same Time

Installation of a motorized drilling head in place of the tailstock on an automatic lathe enables turning, facing, drilling, reaming, and grooving a cast-iron part in one simultaneous operation. Feeding a combination drill and reamer, the attachment provides fine feed for

drilling and coarse feed for reaming. Two tools on the front carriage turn separate diameters. The rear tool block carries two facing tools and a grooving tool. All tools work simultaneously. (Seneca Falls Machine Co.)

For more data circle No. 35 on postcard, p. 51

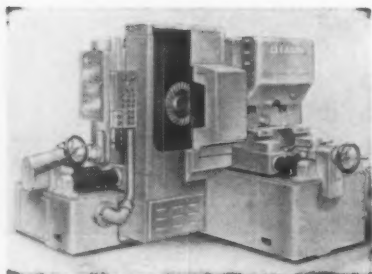


## Bending Roll Forms True Cylinders in One Pass

Virtually true cylinders can be formed in one pass on a new bending roll. The customary flat spots from this process are reduced to fractions of an inch, and without pre-forming. This accuracy is accomplished by use of an adjustable shoe and specially grooved forming

roll which cause the stock to start forming as soon as it enters the roll. Close contact throughout eliminates any flat on the trailing edge. Working length is 6 ft, roll diam 6 in., capacity 12-gage mild steel. (Wysong and Miles Co.)

For more data circle No. 36 on postcard, p. 51



## Gear Lapper Is Versatile and Accurate

An automatic machine laps large spiral bevel and hypoid gears up to 36-in. diam. It handles any shaft angle from 10° to 130°. Relative position of gear and pinion is changed continually to lap the entire tooth surface. Servo-controlled motions and spindle speeds from

200 to 2000 rpm permit complete flexibility and extended control of tooth bearing. Three separate and accurate motions sweep the length of the tooth, move up and down the tooth profile, and maintain uniform backlash. (Gleason Works)

For more data circle No. 37 on postcard, p. 51



## New Press Offers Six-Minute Die Change

A new quick-die-change press permits die changing with just 5 to 6 minutes of downtime. This permits more advantageous scheduling of production runs to produce parts as needed and hold inventories down. In some cases, up to 40 pct more production is achieved. This is

a 1000-ton, single-action, two-point press with 120 x 44-in. bed area and self-propelled bolsters controlled from the master control panel. Exact die positioning for correct shut height is automatic. (Danly Machine Specialties, Inc.)

For more data circle No. 38 on postcard, p. 51



## Barrel Finisher

A rugged barrel finishing machine is constructed of ¼-in. steel plate and requires only 5 sq ft of floor space. Low and with lightweight doors, it is easy to manipu-

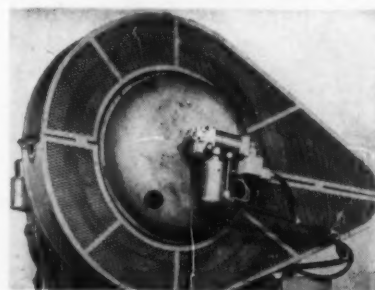


late. A variable-speed drive permits speeds from 8 to 24 rpm. Total capacity is 2000 lb. (Baird Machine Co.)

For more data circle No. 39 on postcard, p. 51

## Press Overload Device

A torque limiter uses a self-adjusting "relief valve" to provide an anticipating protection against the development of dangerous overloads in power presses. Designed for presses with air clutches, it automatically adjusts the amount of air pressure holding the clutch in engagement during the stroke cycle,



according to the predetermined pattern of torque control. (E. W. Bliss Co.)

For more data circle No. 40 on postcard, p. 51

## Pneumatic Sander

An inflated sanding drum using coated abrasive bands is 8-in.-diam. 9 in. wide. Its resilience allows the abrasive to follow contours and presents more abrasive to the work, resulting in high production on both flat and contoured surfaces. Stand-

ard bore is 1¼ in., with larger sizes available. Operating speed is 1800 rpm, with 1200-rpm machines also available. (Nu-Matic Grinders, Inc.)

For more data circle No. 41 on postcard, p. 51

## Reaming Cutters

A new line of reaming cutters can be readily adjusted for size while locked in the bar. Featuring extra-hard, extra-strong adjusting screws with UNF threads, they have very smooth sliding action



on ground surfaces. Adjustment to 0.0002 in. can be made without loosening the locking screw on the bar. They offer full floating action to compensate for alignment errors. Available in a full size range, they will be demonstrated in any plant on request. (Muskegon Tool Industries)

For more data circle No. 42 on postcard, p. 51

## Radius Former

A radius cutter cuts a wide variety of concave and convex shapes, including ball and socket parts, ball-bearing races, profile templates, and form rollers. Attaching quickly and easily to the compound of any lathe, it can also be used on turret lathes and Ex-Cell-O milling machines. Using a tool bit in a C-yoke which is swiveled by a handle, it holds tight tolerances, and eliminates the need for costly form-tool bits, multiple tool setups, and repetitious measurements. (Holdridge Mfg. Co.)

For more data circle No. 43 on postcard, p. 51

## Temperature Indicator

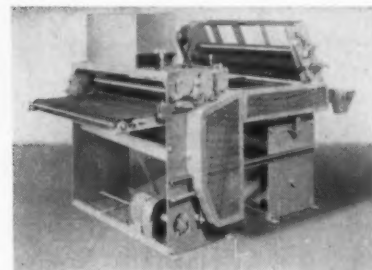
Permitting accurate temperature measurements even at remote locations, a line of temperature indicators are designed for use with inex-

pensive thermistors and ordinary copper-wire leads. Accuracy of  $\pm 2$  pct full scale is obtained. They can measure temperatures of liquids, gases, or soft solids, as well as surface temperatures of solids. (Kahn & Co.)

For more data circle No. 44 on postcard, p. 51

## Roller Coater

Designed for use with high-viscosity materials or compounds, a roller coater applies materials or compounds to the rolls by "ironing" them onto the applicator roll. This reduces the problem of stringy coatings and eliminates foaming, permitting application of substances which could not formerly be

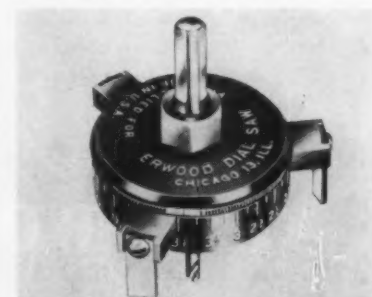


roller-coated. Better coated surfaces are attainable. Tandem setups can be used when extra-heavy coatings are required, or when a conditioner must be applied to the work before the final coating. (Murray-Way Corp.)

For more data circle No. 45 on postcard, p. 51

## Adjusting Hole Cutter

An adjustable dial saw or hole cutter has three single-edge cutters which adjust together to proper hole diameter, from 1½ to 3½ in. There

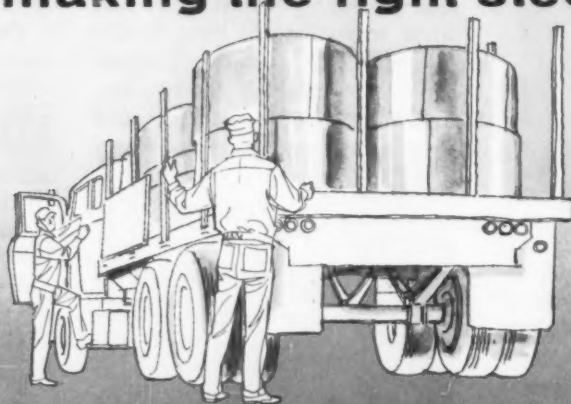


are two models, with respective shanks of ¾ and ½ in. A 3/16-in. pilot drill is included. (Erwood, Inc.)

For more data circle No. 46 on postcard, p. 51

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## The Iron Age Summary

## Industry Raises Price Question

It's no longer a sure thing that steel prices won't go up. In fact, sentiment is growing that they will, if the steel labor settlement is a forced one.

**Demand is intensified by fear of a second walkout when the Taft-Hartley injunction expires.**

■ A period of short-term uncertainty confronts both steel users and producers as strike-torn 1959 draws to a close.

The two big uncertainties are the possibility of a renewed strike Jan. 26 and more than hints of price increases to come.

**Mandate Coming?**—The government probably will not allow another walkout when the Taft-Hartley injunction runs out. But in spite of intentions, the strike could resume because of lethargy, lack of planning, and massive confusion in government as to what steps to take.

And the feeling is growing that a mandated settlement may come and, if it does, bring a steel price

increase.

**Record Production**—But before the T-H injunction runs out, fear of a possible work stoppage will result in more steel in January (on a daily basis) than ever produced in the industry's history. If there is not a second shutdown, the record rate of production will continue through the first six months of 1960.

The same fear will prompt customers to keep pressure on their supply sources regardless of the volume of finished steel they are now receiving.

**Competition Tough** — Need of users to get steel for their own production schedules will put competition at the mill at an all-time peak of intensity during the first four months.

Small customers, who have bitter memories of periods of similar competition, are watching closely to see that they are not nudged out of line by larger customers. The finger generally points to the auto industry when pressure at the mill is mentioned.

Hard-pressed steel sales offices did experience a holiday lull in customer intensity in the past week. But buyers are expected to be back pounding on the mills' doors as soon as the New Year arrives.

**Last Offer Poll**—The steel union reports early returns on its own poll of members on the "last offer" voting show a nine to one margin for rejection. Although some steel executives still believe the company can win the vote, the majority of them believe it is a lost cause.

This will not dull the intensity of the steel industry's campaign, nor will it ease determination to go down to the wire on its last offer. As predicted, the recent flurry of activity by negotiators was mere window dressing and brought no progress.

**Inventory Problem**—The market continues tight, with no easing in sight for at least four months. Consumers face the problem of building up steel inventories in the face of a high rate of manufacturing during the first half.

## Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
<b>Production</b>	2,689	2,661	2,542	2,058
<b>Ingot Index</b> (1947-1949=100)	167.4	165.7	163.9	128.1
<b>Operating Rates</b>				
Chicago	94.0	96.5*	91.0	83.0
Pittsburgh	96.5	96.0	93.5	74.0
Philadelphia	101.5	100.0	100.0	74.0
Valley	91.0	90.0*	88.5	69.0
West	92.0	92.0	89.0	76.0
Cleveland	99.0	93.0*	92.0	80.0
Detroit	99.0	96.0*	93.0	94.0
Buffalo	107.0	107.0	105.0	66.0
South Ohio River	99.0	91.0*	98.0	83.0
South	89.0	89.5	87.0	72.0
Upper Ohio River	95.0	94.0	92.0	84.5
St. Louis	100.0	78.0*	103.0	97.0
<b>Aggregate</b>	95.0	94.0	93.0	76.2

\*Revised

## Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
<b>Composite price</b>				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	\$66.41	\$66.41	\$66.41	\$66.41
Scrap No. 1 hvy (Gross ton)	\$41.17	\$41.17	\$43.50	\$39.83
No. 2 bundles	\$27.83	\$27.83	\$29.83	\$29.00
<b>Nonferrous</b>				
Aluminum ingot	28.10	28.10*	26.80	26.80
Copper, electrolytic	33.00	33.00	30.33	29.00
Lead, St. Louis	11.80*	12.30	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	98.50	99.00	100.00	99.125
Zinc, E. St. Louis	12.50	12.50	12.50	11.50



# The Secret Is to Know Markets

**If you are buying primary materials you should know as much about these markets as the producers and sellers.**

**This is the way to improve purchasing methods.**

■ Kenneth Green is a purchasing agent who knows what an FRB Index is.

Further, he knows how to weight it, adjust it, modify it, and otherwise squeeze it dry of information.

Mr. Green has been buying for Electric Storage Battery Co., Philadelphia, since 1945. The main item on his list is lead. Like most primary materials which don't derive value from manufacture, lead is sold by type and specifications. There is no quality factor. There is no difference between the lead of the various suppliers.

**Keen Awareness**—Mr. Green believes the purchasing agent buying such primary materials should be as keenly aware of markets, trends, conditions almost to the minute, and possible influences, as is the seller.

The PA can decide whom to buy from based on the kind of service the various suppliers are willing to give. But he has to be a marketing and markets expert to decide when and how to buy.

**Right Timing**—Example: At one time it became apparent to Mr. Green that there was going to be a strike against lead producers. He had to cover. But the market was already firming up, and Electric Storage Battery is a big enough lead buyer to move the price, practically by itself.

Mr. Green's marketing knowledge let him make the entire transaction — a six month supply of lead for one of the country's largest

battery makers — within two hours, without moving the price. Electric weathered the strike well.

**Know Your Market**—Mr. Green also feels that if a purchasing agent becomes familiar enough with markets he will accomplish other goals. For one, the current chestnut of management recognizing purchasing's place on the "first team", would become academic, believes this PA. If you really know your market, management is going to call on you often and recognize your ability rather than your function.

Also, there's a lot of room for some original thinking. For instance, right now Mr. Green is wondering about the accuracy of some figures on the replacement battery market collected and released by some statistical agencies.

He has good reason to believe that some companies may have been deliberately withholding information from them to deliberately distort the market. As many as 600,000 batteries a year may be involved.

**Religious Attention**—Long hours of carefully plotting market trends and curves, and religious attention to anything that might add to his market knowledge is Mr. Green's chief base for his unusual contention.

How to buy primary materials can be a major problem, says Mr. Green. A purchasing agent must see past the initial price. For instance, by spotting, or drifting in and out of the market for tonnages depending on market condition or price, a company may save a few cents.

But such a system insures a constantly chaotic market which makes it difficult to relate cost of raw materials to finished items on long term. Mr. Green advocates part monthly averaging and part spot-ping.



**KENNETH W. GREEN:** Know as much about the market as the seller.





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# Full Order Books Certain in 1st Half

**Mill order books for most products will be crammed during first six months of the coming year.**

**But, until labor situation clears, mills are not anxious to book beyond March.**

■ Here's the rundown of first half prospects:

For some products—such as tinplate and galvanized sheet—little can dull demand for nine months or more. After mills opened first quarter books, customers quickly filled them up. Right now, buyers are eager to place orders for second quarter delivery.

**Some Caution**—But generally, the mills are cautious about going that far ahead. There are ample reasons. Mills down during the 116-day strike are still working on third and fourth quarter orders. Some of this tonnage won't be shipped until late January or even February.

In addition, the mills must consider the possibility of another shutdown after Jan. 26. If this happens, order books will be even more scrambled, if possible. A lot of paper work will have to be re-done.

Since the strike, most steel products—with emphasis on sheet, plate, and bar—have gone on a quota basis. Mills are convinced these allotments or space reservations will be in force for much of 1960. Further steel shutdowns will only add to the length of the quota period.

**Sheet and Strip**—All sheet products remain tight as a drum. Mills have set up buyer quotas on all

items—including electrical and silicon sheets. Solid demand for the first half of 1960 seems assured. Galvanized and tinplate may remain critical longer than that. Stainless sheet is generally booked through the first quarter.

**Plates and Shapes**—New orders for plates and structurals are coming in at a steady rate. Capacity production is certain at plate mills for the first half. Mills say February and March tonnages are being snapped up. Buyers are on a quota basis.

Fourth quarter plate orders should be cleaned up by January, mill sources say. There may be some carryover into February. Military-rated orders for alloy plate are strong. But otherwise defense requirements have stabilized at low levels.

**Bars**—After a slow start, bar mills are now operating at high levels. But an ingot shortage may keep production below capacity in the next few months. Demand looks strong for the first six months of next year.

## PURCHASING AGENT'S CHECKLIST

European steel making and selling takes on a new look. P. 17

Cost-cutting program involves more than 800 defense contractors, saves over \$25 million in less than a year. P. 20

Special machine tools can be adapted for work on a variety of tough jobs. P. 48

**Tinplate**—Tin mill production and shipments are moving into high gear. This is normally the time when the mills build up inventories. But this year they are shipping tinplate as fast as it is made. The prospect is for peak demand through the first three quarters of '60. Because of tinplate supply problems, aluminum is making new inroads into the container market.

**Pipe and Tubing**—Mill backlogs on oil country seamless average about four months. For standard pipe, they are about three months. Customers are buying strictly to meet needs. There's little chance to build up any inventories. Orders at one **Pittsburgh** mill are coming in faster than shipments are going out. As a result, the mill's backlog keeps growing.

**Fabricated Steel**—Both bookings and shipments are expected to top 1959 levels during 1960, according to the American Institute of Steel Construction. Bookings next year are estimated at 3.5 million tons, an increase of half a million tons over 1959 orders. Shipments should total 3.4 million tons, a 13 pct boost over this year.

The construction industry will offer fabricators their largest share of new orders. Industrial expansion should be strong. But gains are also expected in commercial building.

The structural steel industry goes into 1960 with about a 1.8 million ton backlog. This is about the same amount of future work the industry had at the beginning of January, 1959.

November bookings of fabricated structurals increased 7 pct over September, the Institute reports.

**Service Centers**—Efforts to build up stocks are proving difficult for warehouses. Products in the shortest supply—cold-rolled and galvanized sheet—are those tightest at the mill level. Service center inventories of other items such as shapes, plates, and bars are slightly better. But, even here, the long steel shutdown cleaned out much tonnage.

## COMPARISON OF PRICES

(Effective Dec. 29, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (\*).

	Dec. 29 1959	Dec. 22 1959	Dec. 1 1959	Dec. 29 1958
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	13.55	13.55	13.55	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
<b>Tin and Terneplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$10.65	\$10.65	\$10.65	\$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
<b>Bars and Shapes: (per pound)</b>				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
<b>Wire: (per pound)</b>				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
<b>Rails: (per 100 lb.)</b>				
Heavy rails	\$5.75	\$5.75	\$5.75	\$5.75
Light rails	6.725	6.725	6.725	6.725
<b>Semifinished Steel: (per net ton)</b>				
Re-rolling billets	\$80.00	\$80.00	\$80.00	\$80.00
Slabs, re-rolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
<b>Wire Rods and Skelp: (per pound)</b>				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
<b>Finished Steel Composite: (per pound)</b>				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

**Finished Steel Composite**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

**Steel Scrap Composites**

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Dec. 29 1959	Dec. 22 1959	Dec. 1 1959	Dec. 29 1958
<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$70.57	\$70.57	\$70.57	\$70.57
Foundry, Southern Cin'tl	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb.	12.25	12.25	12.25	12.25
<b>Pig Iron Composite: (per gross ton)</b>				
Pig iron	\$66.41	\$66.41	\$66.41	\$66.41
<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$42.50	\$42.50	\$44.50	\$42.50
No. 1 steel, Phila. area	41.50	41.50	44.50	33.50
No. 1 steel, Chicago	39.50	39.50	41.50	43.50
No. 1 bundles, Detroit	37.50*	38.50	41.50	35.50
Low phos., Youngstown	48.50	48.50	48.50	44.50
No. 1 mach'y cast, Pittsburgh	55.50	55.50	55.50	50.50
No. 1 mach'y cast, Phila.	54.50	54.50	54.50	48.50
No. 1 mach'y cast, Chicago	60.50	60.50	62.50	53.50
<b>Steel Scrap Composite: (per gross ton)</b>				
No. 1 hvy. melting scrap	\$41.17**	\$43.50	\$39.83	\$39.83
No. 2 bundles	27.83	27.83	29.83	29.00
<b>Coke, Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.75-15.50	\$14.75-15.50	\$14.50-15.50	\$14.50
Foundry coke, prompt	18.50	18.50	18.50	18-18.50
<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	33.00	33.00	30-33	29.00
Copper, Lake, Conn.	33.00	33.00	33.00	29.00
Tin, Straits, N. Y.	98.50†	99.00	100.00	99.75
Zinc, East St. Louis	12.50	12.50	12.50	11.50
Lead, St. Louis	11.80*	12.30	12.80	12.80
Aluminum, virgin ingot	28.10	28.10**	26.80	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. \*\* Revised.

**PIG IRON**

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mail.	Bess.	Low Phos.
Birdshore, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50			
Birmingham W9	62.00	62.50	66.50		
Birmingham U4	62.00	62.50	66.50		
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo H1	66.00	66.50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.00	66.50	67.00	67.50	
Chicago J4	66.00	66.50	66.50		
Cleveland A5	66.00	66.50	66.50	67.00	71.00†
Cleveland R3	66.00	66.50	66.50	67.00	
Duluth J4	66.00	66.50	66.50	67.00	71.00†
Erie J4	66.00	66.50	66.50	67.00	71.00†
Everett M6	67.50	68.00	68.50		
Fontana K1	75.00	75.50			
Genova, Utah C7	66.00	66.50	66.50		
Granite City G2	67.90	68.40	68.90		
Hubbard Y1			66.50		
Ironton, Utah C7	66.00	66.50			
Midland C11	66.00				
Minnequa C6	66.00	66.50	69.00		
Monezen P6	66.00				
Neville Ia. P4	66.00	66.50	66.50	67.00	71.00†
N. Tomawanda T1	66.00	66.50	67.00	67.50	
Sharpsville S3	66.00	66.50	66.50	67.00	
So. Chicago R3	66.00	66.50	66.50	67.00	
So. Chicago W8	66.00	66.50	66.50	67.00	
Swedeland A2	66.00	66.50	69.00	69.50	73.00†
Toledo I4	66.00	66.50	66.50	67.00	
Troy, N. Y. R3	66.00	66.50	69.00	69.50	73.00
Youngstown Y1			66.50		

**DIFFERENTIALS:** Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), H1, \$79.25; Jackson J1, I4 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Keokuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 16 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under 10 pct phos.), \$64.00. Add \$1.00 premium for all grades silvery to 16 pct.

† Intermediate low phos.

**STAINLESS STEEL**

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	439
Ingot, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	48.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

**STAINLESS STEEL PRODUCING POINTS:**

**Sheets:** Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, Md., J2; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, M2; Louisville, O., R5.

**Strip:** Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Detroit, S1; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, R5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (25¢ per lb. higher); Seymour, Conn., S13 (25¢ per lb. higher); New Bedford, Mass., R6; Gary, U1 (25¢ per lb. higher); Baltimore, Md., E1 (300 series only).

**Bar:** Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3, R3; Ft. Wayne, I4; Detroit, R5; Gary, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8; Ambridge, Pa., B7.

**Wire:** Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Newark, N. J., D2; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monezen, P1; Syracuse, C11; Bridgeville, U2; Detroit, R5; Reading, Pa., C2; Bridgeport, Conn., N8.

**Structural:** Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

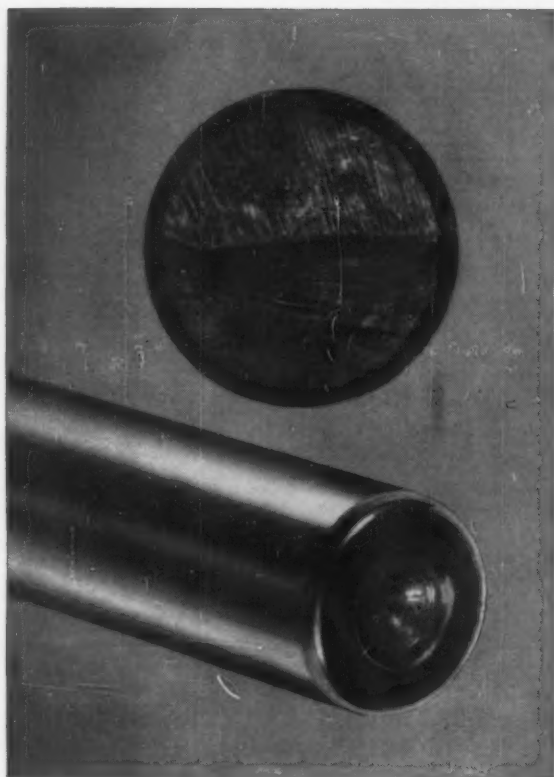
**Plates:** Ambridge, Pa., B7; Baltimore, E1; Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C5; Vandergrift, Pa., U1; Gary, U1.

**Forging billets:** Ambridge, Pa., B7; Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8; Reading, Pa., C2.

(Effective Dec. 28, 1959)



# You benefit seven ways from Republic Steel Bar SERVICE IN DEPTH



**COLD DRAWN CARBON CORRECTED BARS HELP BRIGGS & STRATTON BOOST PISTON PIN PRODUCTION.** The company was experiencing production difficulties and was not satisfied with piston pin quality from a performance standpoint. On the advice of a Republic Field Metallurgist, Briggs & Stratton switched to Republic C-1050 Cold Drawn Carbon Corrected Bars. The results were immediate. Production increased substantially. Rejects dropped to a minimum. Pin quality maintained at the highest level. Other advantages of Cold Drawn Carbon Corrected Bars include: Better machinability. Savings in both metal and money by eliminating waste. No need to buy bars oversize to allow for decarb removal. Photo shows finished piston pin used in Briggs & Stratton 1¾ to 3 hp engines. Note induction hardening in cutaway view.

Steel bar service in depth is an exclusive Republic concept, designed to help you solve steel bar problems and to benefit you these seven ways:

**1. Facilities**—Republic bar mills are strategically located in relation to major use areas. Hot rolled mills at Cleveland, Youngstown, Buffalo, Massillon, Chicago, Canton, Gadsden; cold finished mills at Massillon, Hammond, Beaver Falls, Hartford, and Los Angeles.

**2. Abilities**—Republic's broad and specialized experience has been gained as the nation's number one producer of alloy and carbon bars, and leader in the production of special quality steels, such as forging bars.

**3. Shapes and Sizes**—Modern bar mills produce a complete range of sizes and materials—carbon, alloy, stainless, and titanium—in ¼" to 10" rounds, also squares, hexagons, octagons, flats, and special sections.

**4. Variety**—In addition to regular merchant quality, production includes coil spring and spring bar quality, cold heading and cold extrusion quality, high quality alloy and carbon steel bar products in heavier weight coils.

**5. Quality**—Republic combines quality control at every step of production with the most advanced features of bar mill design to meet today's exacting requirements for high quality steel bar products.

**6. Dependability**—Republic's aim has been to build capacity to provide more steel tonnage for existing customers as well as supply additional users. Assurances of steel to customers are real assurances. Orders are not taken by Republic unless capacity is available to fill them.

**7. Metallurgical Service**—Republic's famed 3-Dimension Metallurgical Service Teams—field, mill, and laboratory—are always available to help your personnel apply Republic's high quality bar products to your product. Carbon, alloy, stainless, and titanium metallurgists will assist in the selection, application, and processing of the right bar product for the job. No obligation. The coupon is your invitation to use this service.

Here are three examples of steel bar *service in depth*.

# REPUBLIC

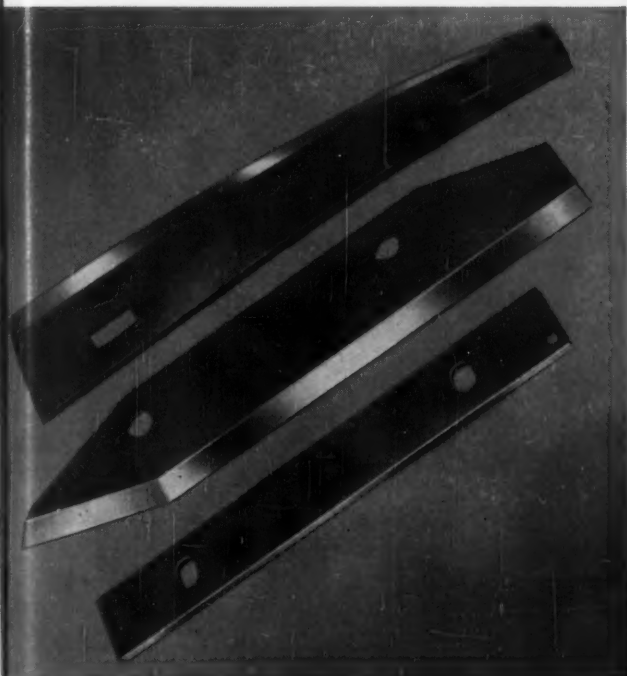
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**REPUBLIC HOT ROLLED SPECIAL SECTION REDUCES COST** on this rail anchor through elimination of most machining and forming operations. The special section is preformed to the predominating cross section of the part. If you design or produce steel parts you will be interested in these advantages of Republic Special Sections: (1) Almost limitless flexibility in design. (2) One-piece shapes replace costly assemblies. (3) Simplification of built-up, interlocking or associated parts. Republic Special Sections are available hot rolled or cold drawn in carbon, alloy, titanium, and stainless steel. Send coupon for full facts.

**3-D METALLURGICAL SERVICE HELPS AGRICULTURAL KNIFE MANUFACTURER SLASH PRODUCTION COSTS.** Lund Products Company, Maynard, Massachusetts, produces cutting knives for agricultural equipment. A quality product, Lund wanted to make them better to withstand even the most severe abuse. Republic metallurgists offered advice on practices and procedures in working alloy steels. The result? A superior cutting knife, produced at a substantial reduction in cost. 3-D Service is available to all steel users without obligation. Clip and mail coupon.



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# Market Closes Year On Quiet Note

**Trading is light as the year draws to a close. New orders aren't expected until next week.**

**While the labor situation is still uncertain, dealers look for prices to stabilize near present levels.**

■ The market is moving quietly toward the end of the year. Trading is light, although scrap is moving on old orders. And few new orders are expected before early January.

Nobody is positive which way the market will move when orders are placed. For this reason, they're looking to automotive list of production scrap to give an indication late this week.

However, the general feeling is that prices have about reached the low point and will firm up near the present level. And despite the steady decline of recent weeks, many still look for prices to go up as soon as several mills enter the market for sizable tonnages.

But uncertainty still surrounding the outcome of steel labor negotiations is holding optimism in check. Even so, many dealers insist they will resist any further reductions in prices for scrap. And there are reports that the resistance has already started.

**Pittsburgh** — Prices for most grades are unchanged here. In the dealer market there are signs prices have reached bottom. For the first time in weeks, brokers are resisting mill attempts to buy at low prices. In the industrial market, heavy lists for January are attracting strong mill interest. However, the labor

uncertainty continues to work against any real market strength. The mills are said to be low on scrap inventory. On the other hand, the time is approaching when scrap shipments may be cut off again.

**Chicago** — The market moved into the usual holiday doldrums, highlighted by the sale of factory bundles off about 50¢ from previous prices. Turnings continued to move at existing price levels, but the quantity offered for sale at these prices appears to be shrinking. However, existing sales have shown greater firmness than had been expected.

**Philadelphia** — Volume of scrap moving in the area is low. Weekly buying has been going on at current prices, but tonnages are considered insignificant. Export will be up in January, but domestic mill purchases are still a question mark. However, there is some feeling that prices have hit bottom and will stabilize near present levels.

**New York** — This area is very quiet at year's end. Brokers and dealers are anxiously awaiting offerings of automotive lists in Detroit later this week in hopes of getting a clue to the market direction.

**Detroit** — Prices continue to decline in most grades. There's not much buying or selling going on currently. There will be a great deal of automotive scrap coming from plants in January. However, dealers have expressed doubt that mills will do much buying this month. If mills do buy, shipments will have to be made before Janu-

ary 15 as mills prepare for another possible walkout.

**Cleveland** — Heavy industrial tonnages are bearing down on a quiet market. In the immediate Cleveland area some 26,000 tons of automotive scrap are being offered for January delivery. One plant is selling 80 pct more than in December. In the dealer market, scrap is moving freely on old orders. No new buys have been made.

**St. Louis** — Offerings of scrap steel in this area are very light. Prices are mostly unchanged. Mills are just not interested in buying at this time.

**Cincinnati** — The market here is quiet. Old orders are pretty well covered and there is little trading at the broker level. New orders from one mill aren't expected until after the first of the year.

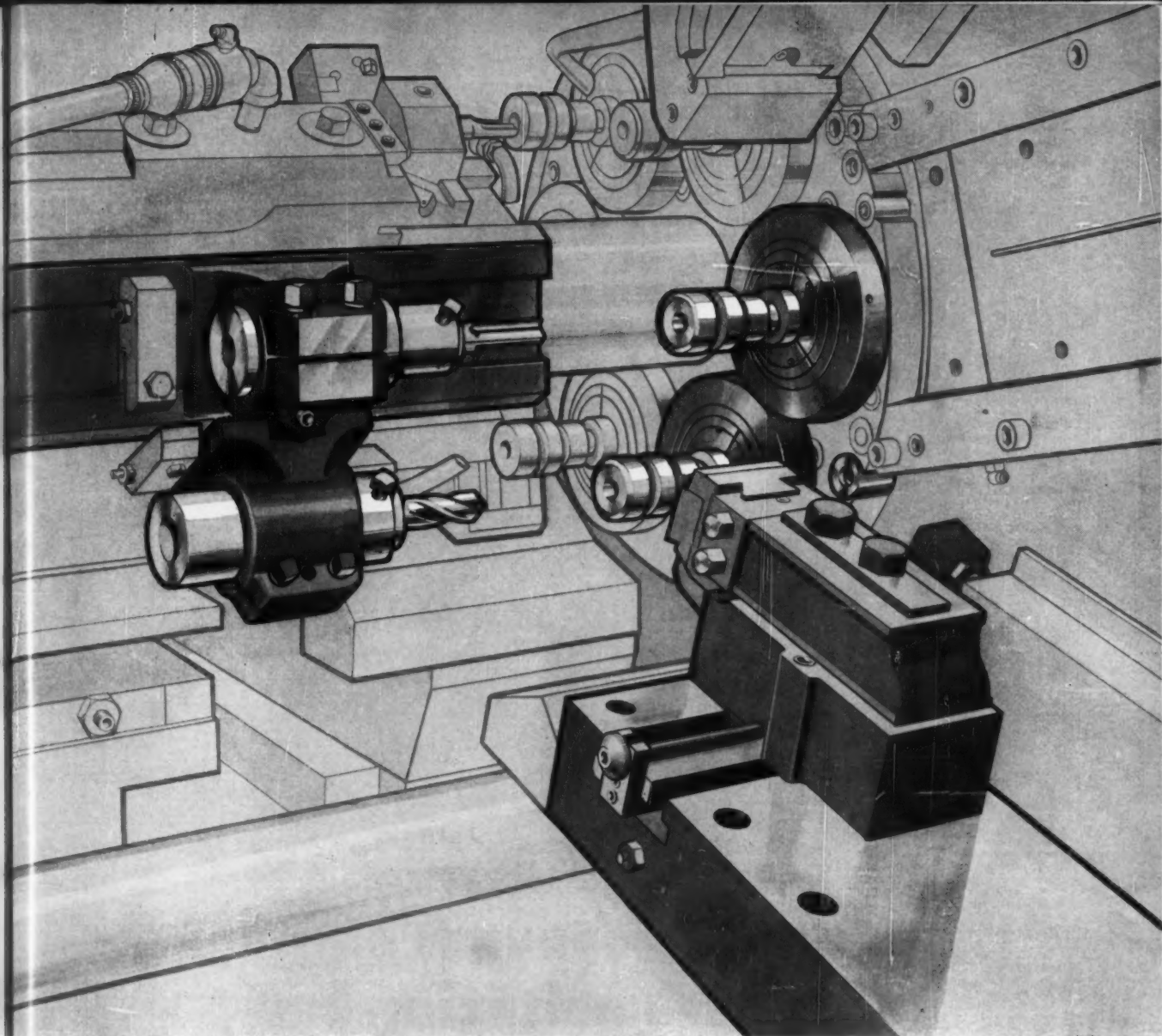
**Birmingham** — More consumers are buying scrap, but quantities are limited and prices are about the same. Most dealers, however, refuse to accept lower prices. An Atlanta mill bought No. 2 heavy melting at \$1 less than its last purchase. Yards in that area filled the order.

**Buffalo** — Market here remains inactive. Many dealers have resigned themselves to a continual lull until after the New Year. Even then, some dealers feel activity may be limited until after a steel settlement.

**Boston** — There's no change in the present market. Domestic business is tough; export activity is at a minimum. And there are no prospects for a sudden change.

**West Coast** — There are few signs of life in the scrap market on the West Coast. Prices are weak. Mills are marking time awaiting the outcome of the steel negotiations.

**Houston** — The market is very quiet. Cast market shows signs of weakening. Exporters are quoting prices \$3 to \$4 a ton above domestic prices for heavy melting grades, although export activity is sporadic at best. Outlook for export during the next month isn't good.



## *New Britain's* **answer** to a serious threat

Overseas production of just about anything you care to name is making serious inroads on American domestic and foreign markets. It's no secret that European and Asian industry is catching up fast technologically—and they have a real competitive advantage in plenty of low cost skilled labor. While many foreign products are still inferior to those of domestic manufacture, this is far from true in all cases. The answer is, of course, increased productivity at lower cost.

In its all-new line of bar machines, New Britain has developed the most modern bar-turning units available. Five models in two different series are offered with capacities from 1½" to 5½". These machines are designed for really fast, trouble-free, high-precision production. More operations per machine are possible than ever before. Wide open tool areas allow unlimited combinations of end working and forming tools. New Britains will stay new longer. The exclusive wear-preventing features so

familiar to New Britain users have been retained and improved. Catalogs on both the small and large series machines are yours for the asking. After looking this literature over if you think one or more New Britains may help improve your competitive situation, we will be happy to review your prints and arrange a demonstration. No obligation, of course. Call us or call your local representative. New Britain-Gridley Machine Division, The New Britain Machine Company, New Britain, Connecticut.



# SCRAP PRICES

(Effective Dec. 29, 1959)

## Pittsburgh

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	35.00 to 37.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	50.00 to 51.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs plate	52.00 to 53.00
Heavy turnings	37.00 to 38.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	60.00 to 61.00
Rails 2 ft and under	66.00 to 67.00
RR specialties	57.00 to 58.00
No. 1 machinery cast.	55.00 to 56.00
Cupola cast.	51.00 to 52.00
Heavy breakable cast.	49.00 to 50.00
Stainless	
18-8 bundles and solids	235.00 to 240.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	60.00 to 65.00

## Chicago

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	40.00 to 41.00
No. 1 factory bundles	44.50 to 45.50
No. 2 bundles	26.00 to 27.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. forge crops	54.00 to 55.00
Low phos. punch'gs plate,	
1/4 in. and heavier	51.00 to 52.00
Mixed bor. 2 ft. and under	49.00 to 50.00
No. 1 RR hvy. melting	45.00 to 46.00
Scrap rails, random lgth.	56.00 to 57.00
Rerolling rails	63.00 to 64.00
Rails 2 ft. and under	62.00 to 63.00
Angles and splice bars	54.00 to 55.00
RR steel car axles	59.00 to 60.00
RR couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	60.00 to 61.00
Cupola cast.	54.00 to 55.00
Cast iron wheels	62.00 to 63.00
Malleable	50.00 to 51.00
Stove plate	51.00 to 52.00
Steel car wheels	51.00 to 52.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

## Philadelphia Area

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	45.00 to 46.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	22.00 to 23.00
Mixed bor. short turn.	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	26.00 to 27.00
Clean cast. chem. borings	26.00 to 27.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. 2 ft punch'gs	50.00 to 51.00
Elec. furnace bundles	48.00 to 49.00
Heavy turnings	34.00 to 35.00
RR specialties	50.00 to 51.00
Rails, 18 in. and under	67.00 to 68.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	46.00 to 47.00
Cast iron car wheels	50.00 to 51.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	54.00 to 55.00

## Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	20.00 to 21.00
Low phos. 18 in. and under	48.00 to 49.00
Rails, random length	54.00 to 55.00
Rails, 18 in. and under	62.00 to 63.00
No. 1 cupola cast.	49.00 to 50.00
Hvy. breakable cast.	44.00 to 45.00
Drop broken cast.	59.00 to 60.00

## Youngstown

No. 1 hvy. melting	\$45.50 to \$46.50
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	45.50 to 46.50
No. 2 bundles	29.00 to 30.00
Machine shop turn.	20.50 to 21.50
Shoveling turnings	25.50 to 26.50
Low phos. plate	48.00 to 49.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Cleveland

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	34.50 to 35.50
No. 1 dealer bundles	42.00 to 43.00
No. 1 factory bundles	45.50 to 46.50
No. 2 bundles	25.50 to 26.50
No. 1 busheling	42.00 to 43.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Cut structural & plates, 2	
ft & under	48.50 to 49.50
Drop forge flashings	42.00 to 43.00
Low phos. punch'gs plate	43.00 to 44.00
Foundry steel, 2 ft & under	42.00 to 43.00
No. 1 RR hvy. melting	45.50 to 46.50
Rails 2 ft and under	65.00 to 66.00
Rails 18 in. and under	66.00 to 67.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	60.00 to 61.00
No. 1 machinery cast.	56.00 to 57.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	100.00 to 110.00
430 bundles	115.00 to 120.00

## Buffalo

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	20.00 to 21.00
Low phos. plate	44.00 to 45.00
Structurals and plate,	
2 ft and under	44.00 to 45.00
Scrap rails, random lgth.	42.00 to 43.00
Rails 2 ft and under	52.00 to 53.00
No. 1 machinery cast.	53.00 to 54.00
No. 1 cupola cast.	49.00 to 50.00

## St. Louis

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	19.50 to 20.50
Shoveling turnings	21.50 to 22.50
Cast iron borings	24.00 to 25.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails, random lengths	52.00 to 53.00
Rails, 18 in. and under	57.00 to 58.00
Angles and splice bars	50.00 to 51.00
RR specialties	49.00 to 50.00
Cupola cast.	51.00 to 52.00
Heavy breakable cast.	45.00 to 46.00
Stove plate	44.50 to 45.50
Cast iron car wheels	48.50 to 49.50
Rerolling rails	62.00 to 63.00
Unstripped motor blocks.	45.00 to 46.00

## Birmingham

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	23.00 to 24.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	38.00 to 39.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft.	43.00 to 44.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	52.00 to 53.00
Rails, 18 in. and under	56.00 to 57.00
Angles and splice bars	49.00 to 50.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	44.00 to 45.00
Unstripped motor blocks.	42.00 to 43.00

## New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	28.00 to 29.00
No. 2 dealer bundles	19.00 to 20.00
Machine shop turnings	10.00 to 11.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast.	39.00 to 40.00
Mixed yard cast.	37.00 to 38.00
Heavy breakable cast.	37.00 to 38.00
Stainless	
18-8 prepared solids	200.00 to 205.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

## Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	20.00 to 21.00
No. 1 bushelings	35.00 to 36.00
Drop forge flashings	35.00 to 36.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	21.00 to 22.00
Heavy breakable cast.	40.00 to 41.00
Mixed cupola cast.	46.00 to 47.00
Automotive cast.	51.00 to 52.00
Stainless	
18-8 bundles and solids	205.00 to 210.00
18-8 turnings	80.00 to 85.00
430 bundles and solids	100.00 to 105.00

## Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	11.00 to 12.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	15.50 to 16.50
No. 1 machinery cast.	41.00 to 42.00
Mixed cupola cast.	37.00 to 38.00
Heavy breakable cast.	35.00 to 36.00

## San Francisco

No. 1 hvy. melting	\$40.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	36.00
No. 2 bundles	22.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	\$17.00 to 19.00
Cast iron borings	17.00 to 19.00
No. 1 cupola cast.	47.00

## Los Angeles

No. 1 hvy. melting	\$41.00
No. 2 hvy. melting	39.00
No. 1 dealer bundles	38.00
No. 2 bundles	20.00
Machine shop turn.	\$18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under	
(foundry)	49.00 to 50.00
No. 1 cupola cast.	47.00 to 48.00

## Seattle

No. 1 hvy. melting	\$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

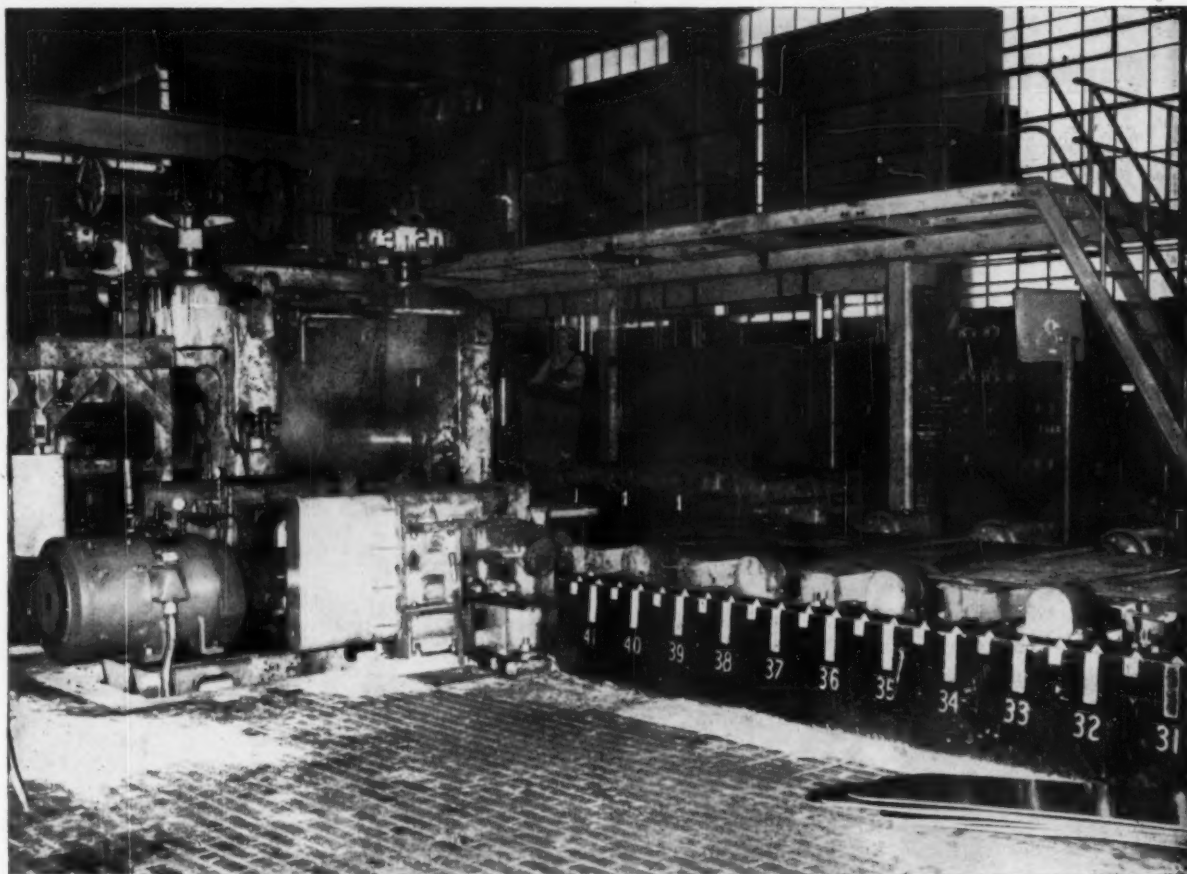
## Hamilton, Ont.

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	24.00
Mixed steel scrap	24.25
Bush., new fact., prep'd.	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Cast scrap	\$46.50 to 48.00

## Houston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	22.00
Cut structural plate	
2 ft & under	\$48.00 to 49.00
Unstripped motor blocks.	37.50 to 38.50
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	34.00 to 35.00





Packaged M-G sets and controls are located right at the hot mill in Revere Copper and Brass, Incorporated's New Bedford, Mass. plant

## Reliance Packaged Drives cut Modernization Cost 20%

Instead of one large motor-generator set, Revere Copper and Brass, Incorporated used five packaged V\*S Drives to power the edger and tables on their rebuilt hot mill.

Reliance Drives package the M-G sets with controls and put them right at the mill itself. Conduit runs are of minimum length, which reduced not only material costs but construction time.

Control installation was vastly simplified. Each V\*S Unit was prewired and pretested before shipping. The complete V\*S

Cabinets had only to be set in place and connected. Extra construction was not required for a generator room.

Packaged V\*S Drives cut costs for Revere and gave more flexibility of operation and greater ease of maintenance. Reliance Packaged Drives will reduce drive installation and operating costs for any type of mill.

For complete details contact your Reliance representative, or write today for Bulletin No. D-2506.

L-1586

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Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V\*S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

## Purchasing Agents—

# How's your

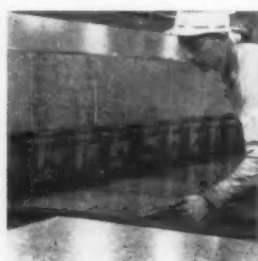
Here's how you can *test yourself* on your skill as a steel buyer. Just answer the following questions after reading the instructions carefully. The correct answers are on the next page. (Don't peek!)

1. One of the types of equipment shown in these four pictures is not ordinarily available at steel service centers. Which is it?

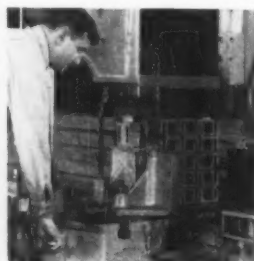
a



b



c



d



2. Service centers usually stock these types of steel (Circle the correct answers—and watch it, this one's tricky!):

a Plates

b Saucers

c Carbon Bars

d Alloy Bars

e Sheets

f Pillow Cases

g Steel Wool

h Structural Shapes

i Reinforcing Bars

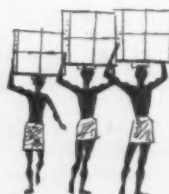
j Foundation Garments

k Tool Steel

3. You get fast steel deliveries from service centers because they ship direct to you by . . . (Select one):



a



b



c



d

# steel BUY-Q.?

## 4. This one tests your powers of logical reasoning:

A steel service center is to the average steel user as . . . (Select one):

- a Soup is to nuts   b Chester is to Marshal Dillon   c His right arm is to Ingemar Johansson

Now check your answers—and good luck!

### ANSWERS:

(1) You should have checked (d). Not that service centers wouldn't have a couple spinning wheels around if they'd be of service to you—it's just that there hasn't been much demand lately. Credit: 15 points.

(2) You should have omitted (b), (f), (g), and (j), and we won't budge an inch. Credit: 40 points. Subtract 5 for every item you got wrong.

(3) If you picked (d) again you're right on the beam. Most of our readers prefer truck deliveries, all things considered. Credit: 20 points.

(4) If you picked (b), you're right. BUT, if you picked both (b) and (c), we'll give you *double* credit. Score: 15 points, or 30 if you were really alert!

### Now total your score.

90 and up—Congratulations! You're a top-flight purchasing agent and have probably been buying Bethlehem products from steel service centers for *years*.

80-89—Good show, but there's room for improvement. Don't let your inventories get too big when you should be relying on a service center.

70-79—Better brush up on steel service centers. Use them properly and you'll save your firm lots of money (and *you* may be on your way to Fame and Fortune).

Below 70—You better come by the office and have a long talk with us.

Smart buyers like you undoubtedly scored high. Now why not tell all your friends how *they* can depend on steel service centers for the best of steel products<sup>®</sup> (made by Bethlehem!) and the best of service.

Buy

# BETHLEHEM STEEL

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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation



# Some New Aluminum Mill Prices

**New price sheets aren't out yet, but less competitive items are up more than pig and ingot.**

**Where the competition is sharp, price increases are less than for primary.**

■ It will be well into 1960 before the aluminum mill products price picture is clear.

Rumors have been flying thick and fast that some items would be increased more than the 1.3¢ per lb boost in the price of primary metal, and some less.

**Some New Prices Set**—Based on information given by a producer early this week, at least some of the rumors are true. Although the new price sheets weren't out then it appeared the producers were pretty set on new prices for the less competitive items.

On a percentage basis, new prices for the less competitive items flirted just above five pct, the amount primary metal was boosted.

For example, 2024-T3, heat treated sheet, .032 in. gage costs 3.1¢ per lb more, exactly five pct increase to 64.9¢ per lb.

**Hold Prices Down** — On the highly competitive items, less information was available. Extrusions, perhaps the most competitive, will increase between 3.5 pct and 5.5 pct. The more popular soft extrusions are at the bottom of this range.

**Other competitive items:**

ACSR will cost only 1.16¢ per lb, or 3.6 pct, more. Prices of this item, in sharp competition with cop-

per, are still figured to the hundredths of a cent, 32.01¢ per lb.

Cable covered by 4/64 in. polyethylene costs only \$2 per 1000 ft more, an increase of only 3.2 pct.

**Some price increases on representative less competitive items:**

Sheet — non heat treatable, 3003-H14, increased to 48.2¢ per lb, up 2.5¢, or 5.5 pct.

Plate — heat treated, 2024-T3, ½ in. thick, now costs 51.8¢ per lb, up by 2.5¢, or 5.1 pct.

Plate — non heat treatable, 3003-F, ½ in. thick, 44.6¢ per lb, up 2.3¢ per lb, or 5.2 pct.

Bar—1x2 CF rectangular, 2024-T4, 78.8¢ per lb, increased 3.2¢ per lb, only 4.2 pct.

## Titanium

1960 will be tough going for the titanium industry, says the U. S. Dept. of Commerce. In fact, output of mill products is expected to drop to about 5.2 million lb, from 6 million lb in 1959.

And domestic production of sponge is expected to decline because government purchases have been terminated.

**Watch** — In gaging the relative health of the domestic titanium industry, these are points to watch:

(1) Changes in the defense program; (2) Metallurgical research on production and application techniques; (3) The tariff picture on imports of sponge.

There may be some bright spots in titanium. But they are further ahead than 1960. For one, Com-

merce Dept. says, "Prices of titanium mill products are gradually being reduced, however, and the metal may eventually be used in enough consumer products to be affected by standard key economic indicators."

**Ahead, But Far**—Also: "Applications in the missile programs and proposed uses in ordnance equipment and submarines, if they prove to be feasible, are promising, but any effect on the volume of titanium use would not occur until after 1960."

## Magnesium

The fact that 1959 didn't quite live up to its advance billing hasn't discouraged the industry and Jerry Singleton, association executive secretary. He is again predicting improvement in the year ahead.

Key parts of his forecast: Production will rise to about 40,000 tons. Consumption, he says, will likely top this, but "inventories are adequate."

Also, for the first time shipments of wrought magnesium may top cast.

Tin prices for the week: Dec. 23—99.00; Dec. 24—98.875; Dec. 25—holiday; Dec. 28—98.75\*, Dec. 29—98.50.\*

\* Estimate.

## Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	26.00	24.70	12/17/59
Aluminum ingot	28.10	26.80	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	35.00	33.00	12/23/59
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.00	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	180-180	182-182	8/1/59
Zinc, E. St. L.	12.80	12.5-13	11/2/59
Zinc, N. Y.	13.00	13-13.5	11/2/59

**ALUMINUM:** 99% Ingot **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colborne, Canada. **ZINC:** prime western. **TIN:** See above; Other primary prices, pg. 76.



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# NONFERROUS PRICES

## MILL PRODUCTS

(Cents per lb unless otherwise noted)

### ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136	.250-
			.249	3.
1100, 3003.....	45.7	43.8	42.8	43.3
5052.....	53.1	48.4	46.9	46.0
6061-0.....	50.1	45.7	43.9	44.9

### Extruded Solid Shapes

Factor	6063 T-5	6062 T-5
6-8.....	42.7-44.2	51.1-54.8
12-14.....	42.7-44.2	52.0-56.5
24-26.....	43.2-44.7	62.8-67.5
36-38.....	46.7-49.2	86.9-90.5

### Screw Machine Stock—2011-T-3

Size"	3/4	3/4-1/2	3/4-1	1 1/4-1 1/2
Price.....	62.0	61.2	59.7	57.3

### Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	90	120	144
.019 gage.....	\$1.411	\$1.884	\$2.353	\$2.823
.024 gage.....	1.762	2.349	2.937	3.524

## MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

### Sheet and Plate

Type↓	Gage→	.250	.250-	.188	.081	.032
		3.00	2.00			
AZ31B Stand, Grade.....		67.9	69.0	77.9	108.1	
AZ31B Spec.....		93.3	95.9	106.7	171.3	
Tread Plate.....		70.6	71.7			
Tooling Plate.....		73.9				

### Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C).....	65.3	65.3	66.1	71.6
Spec. Grade... (AZ31B).....	84.6	85.7	90.6	104.3

### Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)  
AZ93A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

## NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel Monel	Inconel
Sheet, CR.....	133	120
Strip, CR.....	124	108
Rod, bar, HR.....	107	89
Angles, HR.....	107	89
Plates, HR.....	130	110
Seamless tube.....	157	129
Shot, blocks.....	87	...

## COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	57.13	.....	54.56	58.32
Brass, Yellow.....	50.57	50.86	50.26	54.23
Brass, Low.....	53.53	53.82	53.22	57.09
Brass, R L.....	54.58	54.87	54.27	58.14
Brass, Naval.....	55.12	.....	48.68	58.78
Muntz Metal.....	53.20	.....	48.26	.....
Comm. Br. ....	56.17	56.46	55.86	59.48
Mang. Br. ....	58.86	.....	62.21	.....
Phos. Br. 5%.....	77.44	.....	78.19	.....

Free Cutting Brass Rod..... 36.08

## TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, \$7.25-\$8.50; alloy, \$13.40-\$17.00. Plate, HR, commercially pure, \$5.25-\$6.00; alloy, \$8.00-\$10.00. Wire, rolled and/or drawn, commercially pure, \$5.55-\$6.05; alloy, \$7.55-\$9.50; Bar, HR or forged, commercially pure, \$4.00-\$4.50; alloy, \$4.00-\$6.25; billets, HR, commercially pure, \$3.20-\$3.70; alloy, \$3.20-\$4.75.

## PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex. 29.50  
Beryllium Aluminum 5% Be, Dollar per lb contained Be..... \$74.75  
Beryllium copper, per lb conta'd Be. \$43.00  
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading..... \$71.50  
Bismuth, ton lots..... \$ 2.25  
Cadmium, del'd..... \$ 1.40  
Calcium, 99.9% small lots..... \$ 4.55  
Chromium, 99.8% metallic base..... \$ 1.31  
Cobalt, 97-99% (per lb)..... \$1.75 to \$1.82  
Germanium, per gm, f.o.b. Miami, Okla., refined..... \$3.30 to \$2.00  
Gold, U. S. Treas., per troy oz..... \$35.00  
Indium, 99.9%, dollars per troy oz. \$ 2.25  
Iridium, dollars per troy oz..... \$75 to \$85  
Lithium, 98%..... \$11.00 to \$14.00  
Magnesium sticks, 10,000 lb..... 57.00  
Mercury, dollars per 76-lb flask f.o.b. New York..... \$212 to \$214  
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel..... 69.60  
Palladium, dollars per troy oz. \$22 to \$24  
Platinum, dollars per troy oz. \$77 to \$80  
Rhodium..... \$120.00 to \$125.00  
Silver ingots (\$ per troy oz.)..... 91.375  
Thorium, per kg..... \$43.00  
Vanadium..... \$ 3.45  
Zirconium sponge..... \$ 5.00

## REMETLED METALS

### Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot  
No. 115..... 30.75  
No. 120..... 29.25  
No. 123..... 28.75  
80-10-10 ingot  
No. 305..... 35.25  
No. 315..... 33.00  
88-10-2 ingot  
No. 210..... 44.00  
No. 215..... 40.75  
No. 245..... 36.00  
Yellow ingot  
No. 405..... 24.75  
Manganese bronze  
No. 421..... 29.25

### Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys  
0.30 copper max..... 26.25-26.50  
0.60 copper max..... 26.00-26.25  
Piston alloys (No. 122 type)..... 28.00-29.00  
No. 12 alum. (No. 2 grade)..... 24.75-25.25  
108 alloy..... 25.25-25.75  
195 alloy..... 27.75-28.75  
13 alloy (0.60 copper max.)..... 26.00-26.25  
AXS-679 (1 pct zinc)..... 25.00-26.00

## Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97 1/2 %..... 25.25-26.25  
Grade 2—92-95 %..... 24.00-25.00  
Grade 3—90-92 %..... 23.00-24.00  
Grade 4—85-90 %..... 22.50-23.50

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	23 1/2	23 1/2
Yellow brass.....	22 1/2	20 1/2
Red brass.....	25 1/2	25
Comm. bronze.....	26 1/2	26
Mang. bronze.....	20 1/2	20
Free cutting rod ends.....	21 1/2	

### Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	29 1/2
No. 2 copper wire.....	26
Light copper.....	23 1/2
*Refinery brass.....	24 1/2
Copper bearing material.....	23 1/2
*Dry copper content.....	

### Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	29 1/2
No. 2 copper wire.....	25 1/2
Light copper.....	23 1/2
No. 1 composition.....	23
No. 1 comp. turnings.....	22 1/2
Hvy. yellow brass solids.....	16 1/2
Brass pipe.....	18
Radiators.....	

Mixed old cast.....	14	—15
Mixed new clips.....	16 1/2	—17
Mixed turnings, dry.....	14 1/2	—15 1/2

### Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

### Copper and Brass

No. 1 copper wire.....	25 1/2	—26
No. 2 copper wire.....	22 1/2	—23
Light copper.....	21	—21 1/2
Auto radiators (unsweated).....	14 1/2	—15
No. 1 composition.....	18 1/2	—19
No. 1 composition turnings.....	17	—17 1/2
Cocks and faucets.....	15	—15 1/2
Clean heavy yellow brass.....	13	—13 1/2
Brass pipe.....	15	—15 1/2
New soft brass clippings.....	15 1/2	—15 1/2
No. 1 brass rod turnings.....	12 1/2	—13

### Aluminum

Alum. pistons and struts.....	7 1/2	—8
Aluminum crankcase.....	11 1/2	—11 1/2
1100 (2a) aluminum clippings.....	15	—15 1/2
Old sheet and utensils.....	11 1/2	—11 1/2
Borings and turnings.....	7	—7 1/2
Industrial castings.....	11 1/2	—11 1/2
2020 (24S) clippings.....	12 1/2	—13

### Zinc

New zinc clippings.....	6 1/2	—6
Old zinc.....	4 1/2	—4
Zinc routings.....	3	—3 1/2
Old die cast scrap.....	2 1/2	—2

### Nickel and Monel

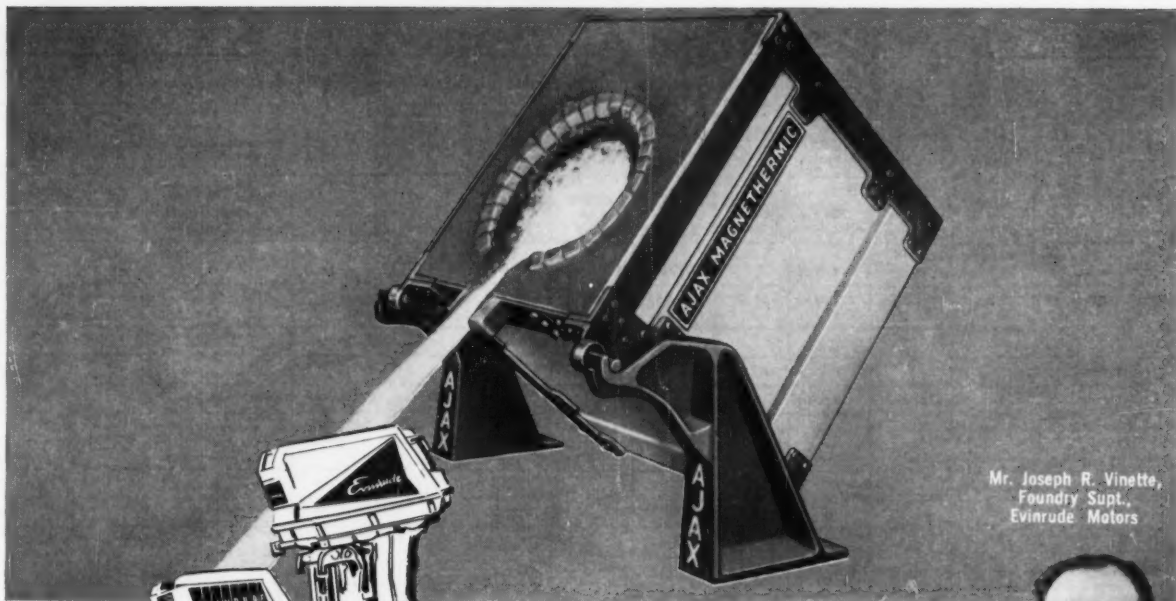
Pure nickel clippings.....	52-54
Clean nickel turnings.....	40
Nickel anodes.....	52-54
Nickel rod ends.....	52-54
New Monel clippings.....	30-32
Clean Monel turnings.....	20-23
Old sheet Monel.....	26-28
Nickel silver clippings, mixed.....	18
Nickel silver turnings, mixed.....	15

### Lead

Soft scrap lead.....	8 1/2	—9 1/2
Battery plates (dry).....	4 1/2	—4 1/2
Batteries, acid free.....	2 1/2	—2

### Miscellaneous

Block tin.....	77	—78
No. 1 pewter.....	59	—60
Auto babbitt.....	40	—41
Mixed common babbitt.....	9 1/2	—10 1/2
Solder joints.....	14	—14 1/2
Siphon tops.....	42	
Small foundry type.....	10 1/2	—10 1/2
Monotype.....	10 1/2	—10 1/2
Lino. and stereotype.....	9 1/2	—9 1/2
Electrotype.....	7 1/2	—8 1/2
Hand picked type shells.....	6	—6 1/2
Lino. and stereo. dross.....	2 1/2	—3 1/2
Electro dross.....	2 1/2	—3 1/2



Mr. Joseph R. Vinette,  
Foundry Supt.,  
Evinrude Motors

## "Our AJAX FURNACES pour round-the-clock with next-to-no maintenance"

"Here, at Evinrude, mass production of parts for outboard motors and power mowers really puts some tough requirements on a melting furnace. Steel crankshafts for the famous Lawn-Boy and for all of the outboard motors made by the Outboard Marine Corporation, as well as the bronze propeller bushings for these motors, require close control of the metal analysis and pouring temperature. Add to this the frequent taps that are made, practically continuous pouring, and you can see that the furnace has to be good.

"Our Ajax-Magnethermic induction furnaces, powered by motor generators handle this job well round-the-clock. In fact, no operating unit in the foundry has needed so little attention. Skilled help or time is at a minimum. An important extra advantage is the ability to use the same furnaces for different metals if we should ever have to change."

*Discover for yourself what Mr. Vinette and others have found to be the key to reliable and economic melting. Ajax furnaces are available for melting ferrous and non-ferrous metals . . . from half-a-ton capacity to ten tons . . . powered by spark gap convertors, motor generators, or the new, fast-growing Multiductor. For details write AJAX ELECTROTHERMIC DIVISION.*

*Induction Heating is our ONLY Business*

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MAGNETHERMIC DIVISION  
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Youngstown 1, Ohio

AJAX ENGINEERING DIVISION  
P.O. Box 1418 • Lalor & Hancock Streets  
Trenton 7, New Jersey



IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled
EAST	Bethlehem, Pa.			\$119.00 B3		5.55 B3	8.10 B3	5.55 B5						
	Buffalo, N. Y.	\$80.00 R3, B3	\$99.50 R3, B3	\$119.00 R3, B3	6.50 B3	5.55 B3	8.10 B3	5.55 B3	5.10 B3, R3	7.425 S16, R7	7.575 B3			
	Phila., Pa.									7.875 P15				
	Harrison, N. J.													15.55 C11
	Conschocken, Pa.		\$104.50 A2	\$126.00 A2					5.15 A2		7.575 A2			
	New Bedford, Mass.									7.875 R6				
	Johnstown, Pa.	\$80.00 B3	\$99.50 B3	\$119.00 B3		5.55 B3	8.10 B3							
	Boston, Mass.									7.975 T8				
	New Haven, Conn.									7.875 D1				
	Baltimore, Md.									7.425 T8				15.90 T8
	Phoenixville, Pa.					5.55 P2		5.55 P2						
	Sparrows Pt., Md.								5.10 B3		7.575 B3			
	New Britain, Bridgeport, Wallingford, Conn.			\$119.00 N8						7.875 W1,S7				8
	Pawtucket, R. I. Worcester, Mass.									7.975 N7, A5				15.90 N7 15.70 T8
MIDDLE WEST	Alton, Ill.								5.30 L1					
	Ashland, Ky.								5.10 A7		7.575 A7			
	Canton-Massillon, Dover, Ohio		\$102.00 R3	\$119.00 R3, \$114.00 T5						7.425 G4		10.80 G4		
	Chicago, Franklin Park, Evanston, Ill.	\$80.00 U1, R3	\$99.50 U1, R3,W8	\$119.00 U1, R3,W8	6.50 U1	5.50 U1, W8,P13	8.05 U1, Y1,W8	5.50 U1	5.10 W8, N4,A1	7.525 A1,T8, M8	7.575 W8		8.40 W8, S9,I3	15.55 A1, S9,G4,T8
	Cleveland, Ohio									7.425 A5,J3		10.75 A5	8.40 J3	
	Detroit, Mich.			\$119.00 R5					5.10 G3, M2	7.425 M2, S1, D1,P11	7.575 G3	10.80 S1		
	Anderson, Ind.									7.425 G4				
	Gary, Ind. Harbor, Indiana	\$80.00 U1	\$99.50 U1	\$119.00 U1, Y1		5.50 U1, I3	8.05 U1, J3	5.50 I3	5.10 U1, I3,Y1	7.425 Y1	7.575 U1, I3,Y1	10.90 Y1	8.40 U1, Y1	
	Sterling, Ill.	\$80.00 N4				5.50 N4	7.75 N4	5.50 N4	5.20 N4					
	Indianapolis, Ind.									7.575 R5				15.70 R5
	Newport, Ky.								5.10 A9				8.40 A9	
	Niles, Warren, Ohio Sharon, Pa.		\$99.50 S1, C10	\$119.00 C10,S1					5.10 R3, S1	7.425 R3, T4,S1	7.575 R3, S1	10.80 R3, S1	8.40 S1	15.55 S1
	Owensboro, Ky.	\$80.00 G5	\$99.50 G5	\$119.00 G5										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 U1, P6	\$99.50 U1, C11,P6	\$119.00 U1, C11,B7	6.50 U1	5.50 U1, J3	8.05 U1, J3	5.50 U1	5.10 P6	7.425 J3,B4 7.525 E3			8.40 S9	15.55 S9
WEST	Weirton, Wheeling, Follinsbee, W. Va.				6.50 U1, W3	5.50 W3		5.50 W3	5.10 W3	7.425 W5	7.575 W3	10.80 W3		
	Youngstown, Ohio	\$80.00 R3	\$99.50 Y1, C10	\$119.00 Y1			8.05 Y1		5.10 U	7.425 Y1,R5	7.575 U1, Y1	10.90 Y1	8.40 U1, Y1	15.55 R3, Y1
	Fontana, Cal.	\$90.50 K1	\$109.00 K1	\$140.00 K1		6.30 K1	8.85 K1	6.45 K1	5.825 K1	9.20 K1				
	Geneva, Utah		\$99.50 C7			5.50 C7	8.05 C7							
	Kansas City, Mo.					5.60 S2	8.15 S2						8.65 S2	
	Los Angeles, Torrance, Cal.		\$109.00 B2	\$139.00 B2		6.20 C1, B2	8.75 B2		5.85 C7, B2	9.30 C1,R5			9.60 B2	17.75 J3
	Minneapolis, Colo.					5.80 C6			6.20 C6	9.375 C6				
	Portland, Ore.					6.25 O2								
	San Francisco, Niles, Pittsburg, Cal.		\$109.00 B2			6.15 B2	8.70 B2		5.85 C7, B2					
	Seattle, Wash.		\$109.00 B2			6.25 B2	8.80 B2		6.10 B2					
	Atlanta, Ga.					5.70 A8			5.10 A8					
	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 T2	\$99.50 T2			5.50 T2 R3,C16	8.05 T2		5.10 T2, R3,C16		7.575 T2			
	Houston, Lone Star, Texas		\$104.50 S2	\$124.00 S2		5.60 S2	8.15 S2						8.65 S2	

(Effective Dec. 28, 1959)



## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL  
PRICES

STEEL PRICES		SHEETS							WIRE ROD	TINPLATE†		Holloware Enameling 29 ga.	
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enamel-ing	Long Turns	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box		Electro** 0.25-lb. base box
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	† Special coated mfg. terms deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conschohocken, Pa.	5.15 A2	6.325 A2				7.575 A2						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.								6.40 B3				
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.325 U1			\$10.50 U1	\$9.20 U1	
	New Haven, Conn.												
	Phoenixville, Pa.												
Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.40 B3	\$9.10 B3		
Worcester, Mass.									6.70 A5				
Trouton, N. J.													
MIDDLE WEST	Alton, Ill.									6.60 L1			
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7						
	Canton-Massillon, Dover, Ohio			6.875 R1, R3									
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R3, W8			
	Sterling, Ill.									6.50 N4, K2			
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5			
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3					
	Newport, Ky.	5.10 A9	6.275 A9										
	Gary, Ind. Harbor, Indiana	5.10 U1, J3, Y1	6.275 U1, J3, Y1	6.875 U1, J3	6.775 U1, J3, Y1	7.225 U1	7.525 U1, Y1, J3	9.275 U1, Y1		6.40 Y1	\$10.40 U1, Y1	\$9.10 J3, U1, Y1	7.85 U1, Y1
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2							\$9.20 G2	7.95 G2	
	Kokomo, Ind.			6.975 C9						6.50 C9			
	Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2							
	Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7							
	Niles, Warren, Ohio Sharon, Pa.	5.10 R3, S1	6.275 R3	6.875 R3 7.65 R3*	6.775 S1	7.225 S1*, R3	7.525 R3, S1	9.275 R3, S1			\$9.10 R3		
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3 7.50 E3*	6.775 U1		7.525 U1, J3	9.275 U1, J3	10.025 U1, J3	6.40 A5, J3, P6	\$10.40 U1, J3	\$9.10 U1, J3	7.85 U1, J3
Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7				
Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3		\$10.40 W5, W3	\$9.10 W5, W3	7.85 W5		
Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1				
WEST	Fontana, Cal.	5.825 K1	7.40 K1				8.25 K1	10.40 K1			\$11.05 K1	\$9.75 K1	
	Geneva, Utah	5.20 C7											
	Kansas City, Mo.									6.65 S2			
	Los Angeles, Torrance, Cal.									7.20 B2			
	Minneapolis, Colo.									6.65 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.80 C7	7.225 C7	7.625 C7						7.20 C7	\$11.05 C7	\$9.75 C7	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.50 T2	\$9.20 T2	
	Houston, Texas									6.65 S2			

\* Electrogalvanized sheets.

(Effective Dec. 28, 1959)

\*7.425 at Sharon-Niles is 7.225

## IRON AGE

Tables identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL  
PRICES

EAST

	BARS						PLATES				WIRE
	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3				8.00 W6
Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4	
Conschockes, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
Harrisburg, Pa.							5.30 P2	6.375 P2			
Milton, Pa.	5.825 M7	5.825 M7									
Hartford, Conn.			8.15 R3		9.325 R3						
Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
Newark, Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
Bridgeport, Putnam, Williamam, Conn.			8.20 W10 8.15 J3	6.80 N8	9.175 N8						
Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
Palmer, Worcester, Roadville, Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
Spring City, Pa.			8.10 K4		9.20 K4						

MIDDLE WEST

Alton, Ill.	5.075 L1										8.20 L1
Ashland, Newport, Ky.							5.30 A7,A9		7.50 A9	7.95 A7	
Carroll, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3 6.475 T5	9.025 R3,R2 8.775 T5		5.30 E2				
Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 U1,R3, W8,N4,P13 5.875 L1	5.675 U1,R3, N4,P13,W8 5.875 L1	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I3	6.375 U1	7.50 U1, W8	7.95 U1, W8	8.00 A5,R3, W8,N4, K2,W7
Cleveland, Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3	8.00 A5, C13,C18
Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P8,B5 7.65 R5	6.725 R5,G3	9.025 R5 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
Duluth, Minn.											8.00 A5
Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, I1	7.50 U1, Y1	7.95 U1, Y1,I3	8.10 M4
Granite City, Ill.							5.40 G2				
Kokomo, Ind.		5.775 C9									8.10 C9
Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10	9.025 C10		5.30 R3,S1		7.50 S1	7.95 R3, S1	
Owensboro, Ky.	5.675 G5			6.725 G5							
Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B4, R3,J3,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, W10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1,J3	7.50 U1, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
Portsmouth, Ohio											8.00 P7
Weirton, Wheeling, Follansbee, W. Va.							5.30 W5				
Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, F2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1	8.00 Y1

WEST

Emeryville, Fontana, Cal.	6.425 J5 6.375 K1	6.425 J5 6.375 K1		7.775 K1		9.00 K1	6.10 K1		8.30 K1	8.75 K1	
Geneva, Utah							5.30 C7			7.95 C7	
Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
Los Angeles, Torrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	9.00 B2					8.95 B2
Minneapolis, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
Portland, Ore.	6.425 O2	6.425 O2									
San Francisco, Niles, Pittsburg, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				9.05 B2					8.95 C7,C6
Seattle, Wash.	6.425 B2,N6, A10	6.425 B2,A10				9.05 B2	6.20 B2		8.40 B2	8.85 B2	

SOUTH

Atlanta, Ga.	5.875 A8	5.875 A8									8.00 A8
Fairfield City, Ala. Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C16			8.30 T2	5.30 T2,R3			7.95 T2	8.00 T2,R3
Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.40 S2	8.05 S2	8.25 S2

† Merchant Quality—Special Quality 35¢ higher.

(Effective Dec. 28, 1959)

\* Special Quality.

# STEEL PRICES

## Key to Steel Producers

### With Principal Offices

- A1 Acme Steel Co., Chicago  
A2 Alan Wood Steel Co., Conshohocken, Pa.  
A3 Allegheny Ludlum Steel Corp., Pittsburgh  
A4 American Cladmetals Co., Carnegie, Pa.  
A5 American Steel & Wire Div., Cleveland  
A6 Angel Nail & Chaplet Co., Cleveland  
A7 Armco Steel Corp., Middletown, Ohio  
A8 Atlantic Steel Co., Atlanta, Ga.  
A9 Acme-Newport Steel Co., Newport, Ky.  
A10 Alaska Steel Mills, Inc., Seattle, Wash.  
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
B2 Bethlehem Steel Co., Pacific Coast Div.  
B3 Bethlehem Steel Co., Bethlehem, Pa.  
B4 Blair Strip Steel Co., New Castle, Pa.  
B5 Bliss & Laughlin, Inc., Harvey, Ill.  
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.  
B7 A. M. Byers, Pittsburgh  
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.  
C1 Calstrip Steel Corp., Los Angeles  
C2 Carpenter Steel Co., Reading, Pa.  
C4 Claymont Products Dept., Claymont, Del.  
C6 Colorado Fuel & Iron Corp., Denver  
C7 Columbia Geneva Steel Div., San Francisco  
C8 Columbia Steel & Shifting Co., Pittsburgh  
C9 Continental Steel Corp., Kokomo, Ind.  
C10 Copperweld Steel Co., Pittsburgh, Pa.  
C11 Crucible Steel Co. of America, Pittsburgh  
C13 Cuyahoga Steel & Wire Co., Cleveland  
C14 Compressed Steel Shifting Co., Readville, Mass.  
C15 C. O. Carlson, Inc., Thorndale, Pa.  
C16 Connors Steel Div., Birmingham  
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.  
D1 Detroit Steel Corp., Detroit  
D2 Driver, Wilbur B. Co., Newark, N. J.  
D3 Driver Harris Co., Harrison, N. J.  
D4 Dickson Weatherproof Nail Co., Evanson, Ill.  
E1 Eastern Stainless Steel Corp., Baltimore  
E2 Empire-Reeves Steel Corp., Mansfield, O.  
E3 Enamel Products & Plating Co., McKeesport, Pa.  
F1 Firth Sterling, Inc., McKeesport, Pa.  
F2 Fitzsimons Steel Corp., Youngstown  
F3 Follansbee Steel Corp., Follansbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.  
G3 Great Lakes Steel Corp., Detroit  
G4 Greer Steel Co., Dover, O.  
G5 Green River Steel Corp., Owenboro, Ky.  
H1 Hanna Furnace Corp., Detroit  
I2 Ingersoll Steel Div., New Castle, Ind.  
I3 Inland Steel Co., Chicago, Ill.  
I4 Interlake Iron Corp., Cleveland  
J1 Jackson Iron & Steel Co., Jackson, O.  
J2 Jessup Steel Corp., Washington, Pa.  
J3 Jones & Laughlin Steel Corp., Pittsburgh  
J4 Joslyn Mfg. & Supply Co., Chicago  
J5 Judson Steel Corp., Emeryville, Calif.  
K1 Kaiser Steel Corp., Fontana, Calif.  
K2 Keystone Steel & Wire Co., Peoria  
K4 Keystone Drawn Steel Co., Spring City, Pa.  
L1 Laclede Steel Co., St. Louis  
L2 La Salle Steel Co., Chicago  
L3 Lone Star Steel Co., Dallas  
L4 Lukens Steel Co., Coatesville, Pa.  
M1 Mahoning Valley Steel Co., Niles, O.  
M2 McLouth Steel Corp., Detroit  
M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.  
M6 Mystic Iron Works, Everett, Mass.  
M7 Milton Steel Products Div., Milton, Pa.  
M8 Mill Strip Products Co., Chicago, Ill.  
M9 Moltrup Steel Products Co., Beaver Falls, Pa.  
N1 National Supply Co., Pittsburgh  
N2 National Tube Div., Pittsburgh  
N4 Northwestern Steel & Wire Co., Sterling, Ill.  
N6 Northwest Steel Rolling Mills, Seattle  
N7 Newman Crosby Steel Co., Pawtucket, R. I.  
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.  
N9 Nelson Steel & Wire Co.  
O1 Oliver Iron & Steel Co., Pittsburgh  
O2 Oregon Steel Mills, Portland  
P1 Page Steel & Wire Div., Monessen, Pa.  
P2 Phoenix Steel Corp., Phoenixville, Pa.  
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
P6 Pittsburgh Steel Co., Pittsburgh  
P7 Portsmouth Div., Detroit Steel Corp., Detroit  
P8 Plymouth Steel Co., Detroit  
P9 Pacific States Steel Co., Niles, Cal.  
P10 Precision Drawn Steel Co., Camden, N. J.

- P11 Production Steel Strip Corp., Detroit  
P13 Phoenix Mfg. Co., Joliet, Ill.  
P14 Pacific Tube Co.  
P15 Philadelphia Steel and Wire Corp.  
R1 Reeves Steel & Mfg. Div., Dover, O.  
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.  
R3 Republic Steel Corp., Cleveland  
R4 Roebbing Sons Co., John A., Trenton, N. J.  
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.  
R6 Rodney Metals, Inc., New Bedford, Mass.  
R7 Rome Strip Steel Co., Rome, N. Y.  
S1 Sharon Steel Corp., Sharon, Pa.  
S2 Sheffield Steel Div., Kansas City  
S3 Shenango Furnace Co., Pittsburgh  
S4 Simonds Saw and Steel Co., Fitchburg, Mass.  
S5 Sweet's Steel Co., Williamsport, Pa.  
S7 Stanley Works, New Britain, Conn.  
S8 Superior Drawn Steel Co., Monaca, Pa.  
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.  
S10 Seneca Steel Service, Buffalo  
S11 Southern Electric Steel Co., Birmingham  
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.  
S13 Seymour Mfg. Co., Seymour, Conn.  
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.  
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
T2 Tennessee Coal & Iron Div., Fairfield  
T3 Tennessee Products & Chem. Corp., Nashville  
T4 Thomas Strip Div., Warren, O.  
T5 Timken Steel & Tube Div., Canton, O.  
T7 Texas Steel Co., Fort Worth  
T8 Thompson Wire Co., Boston  
U1 United States Steel Corp., Pittsburgh  
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.  
U3 Ulbrich Stainless Steels, Wallingford, Conn.  
U4 U. S. Pipe & Foundry Co., Birmingham  
W1 Wallingford Steel Co., Wallingford, Conn.  
W2 Washington Steel Corp., Washington, Pa.  
W3 Weirton Steel Co., Weirton, W. Va.  
W4 Wheatland Tube Co., Wheatland, Pa.  
W5 Wheeling Steel Corp., Wheeling, W. Va.  
W6 Wickwire Spencer Steel Div., Buffalo  
W7 Wilson Steel & Wire Co., Chicago  
W8 Wisconsin Steel Div., S. Chicago, Ill.  
W9 Woodward Iron Co., Woodward, Ala.  
W10 Wyckoff Steel Co., Pittsburgh  
W12 Wallace Barnes Steel Div., Bristol, Conn.  
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

## PIPE AND TUBING

Base discounts (per) l.e.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD																SEAMLESS							
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.		
Sparrows Pt. B3.....	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Youngstown R3.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fontana K1.....	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	*0.75	*15.50										
Pittsburgh J3.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Alton, Ill. L1.....	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Sharon M3.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fairless N2.....	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Pittsburgh N1.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Wheeling W3.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Wheatland W4.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Youngstown Y1.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Indiana Harbor Y1.....	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50										
Lorain N2.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
EXTRA STRONG PLAIN ENDS																								
Sparrows Pt. B3.....	4.75	*9.0	8.75	*5.0	11.75	*9.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Youngstown R3.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Fairless N2.....	4.75	*9.0	8.75	*5.0	11.75	*9.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Fontana K1.....	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75											
Pittsburgh J3.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Alton, Ill. L1.....	4.75	*9.0	8.75	*5.0	11.75	*9.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Sharon M3.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Pittsburgh N1.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Wheeling W3.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Wheatland W4.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Youngstown Y1.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Indiana Harbor Y1.....	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50										
Lorain N2.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		

Threads only, butt weld and seamless, 2 1/4 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 3 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.50¢ per lb.

(Effective Dec. 28, 1959)



## TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	—	\$1.84	T-1
18	4	1	—	—	—	2.545	T-4
18	4	2	—	—	—	2.005	T-2
1.5	4	1.5	8	—	—	1.20	M-1
6	4	2	—	—	—	1.59	M-3
6	4	2	5	—	—	1.345	M-2
High-carbon chromium...							D-3, D-5
Oil hardened manganese							O-2
Special carbon							W-1
Extra carbon							W-1
Regular carbon							W-1
Warehouse prices on and east of Missis-							Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (L4, C4, A3, J2)			Sheet (I2)
	10 pct	15 pct	20 pct	
302				37.50
304	28.80	31.55	34.30	40.00
316	42.20	46.25	50.25	58.75
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	
410	22.70	24.85	27.00	
430	23.45	25.65	27.90	

CR Strip (S9) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

## RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer U1	5.75	6.725	7.25			15.35
Cleveland R3				10.10		
So. Chicago R3						
Ensley T2	5.75	6.725				
Fairfield T2		6.725		10.10	6.875	
Gary U1	5.75				6.875	
Huntington, C16		6.725				
Ind. Harbor I3				10.10		
Johnstown B3		6.725				
Joliet U1			7.25			
Kansas City S2				10.10		15.35
Lackawanna B3	5.75	6.725	7.25		6.875	
Lebanon B3			7.25			15.35
Minneapolis C6	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh S14						15.35
Pittsburgh J3				10.10		
Seattle B2					6.75	15.85
Steelton B3	5.75		7.25		6.875	
Struthers V1				10.10		
Torrance C7					6.75	
Williamsport S5		6.725				
Youngstown R3				10.10		

## COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	\$14.75 to \$15.50
Foundry, beehive (f.o.b.)	\$18.50
Foundry oven coke	
Buffalo, del'd	\$33.25
Ironton, O., f.o.b.	30.50
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erle, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

## LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.	Gross Ton
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

## ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field		9.875	
Armature	11.70	11.20	11.70
Elect.	12.40	12.45	12.40
Special Motor		11.975	
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
Grain Oriented			
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (J3); Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (A9); Niles, O. (S1); Vandergrift (U1); Warren, O. (R3); Zanesville, Butler (A7).

## ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	39.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

\* Prices shown cover carbon nipples.

## REFRACTORIES

## Fire Clay Brick

Super duty, Mo., Pa., Md., Ky.	Carloads per 1000
High duty (except Salina, Pa., add \$5.00)	\$185.00
Medium duty	140.00
Low duty (except Salina, Pa., add \$2.00)	125.00
Ground fire clay, net ton, bulk	103.00
	22.50

## Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty	
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00

Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

## Chrome Brick

Standard chemically bonded, Balt.	Per net ton
Standard chemically bonded, Curt-ner, Calif.	\$109.00
Burned, Balt.	119.00
	103.00

## Magnesite Brick

Standard, Baltimore	\$140.00
Chemically bonded, Baltimore	119.00

## Grain Magnesite

St. % to ½-in. grains	
Domestic, f.o.b. Baltimore in bulk	\$73.00
Domestic, f.o.b. Chewah, Wanh., Luning, Nev.	
In bulk	46.00
In sacks	52.00-54.00

## Dead Burned Dolomite

Per net ton	
F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	\$16.75
Missouri Valley	15.60
Midwest	17.00

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails		Wire Fence		1/2" Fence Posts		Single Loop Bait Ties		Galv. Barbed and Twisted Barbless Wire		Merch. Wire Ann'd		Merch. Wire Galv.	
	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col
Alabama City R3	173	187			212	193			9.00	9.55				
Aliquippa J3***	173	190				190			9.00	9.675				
Atlanta A6**	175	192			214	198			8.75	9.425				
Bartonville K2**	175	192			176	214			9.10	9.775				
Buffalo W6									9.00	9.55*				
Chicago N4**	173	190			177	212			9.00	9.70				
Chicago R3									9.00	9.55				
Cleveland A6														
Cleveland A5									9.00					
Crawf'v. M4**	175	192			214	198			9.10	9.775				
Doners, Pa. A5	173	187			212	193			9.00	9.55				
Duluth A5	173	187			212	193			9.00	9.55				
Fairfield, Ala. T2	173	187			212	193			9.00	9.55				
Galveston D4														
Houston S2	178	192			217	198			9.25	9.801				
Jacksonville M4	184-1	197			219	203			9.10	9.775				
Johnstown B3**	173	190			177				9.00	9.675				
Joliet, Ill. A5	173	187			212	193			9.00	9.55				
Kokomo C9	175	189			214	195*			9.10	9.65*				
L. Angeles B2***									9.95	10.625				
St. Louis T2, B3**	178	192			217	198*			9.25	9.801				
Minneapolis C6	178	192			187	217			9.25	9.801				
Monessen P6									8.65	9.325				
Palmer, Mass. W6									9.30	9.85*				
Pittsburg, Cal. C7	192	210							9.60	10.15				
Rankin, Pa. A5	173	187							9.00	9.55				
So. Chicago R3	173	187							8.65	9.20				
S. San Fran. C6									9.10	9.501				
St. Louis T2, B3**	175				214	198			9.10	9.775				
Struthers, O. Y1*									8.65	9.20				
Worcester A5	179								9.30	9.85				
Williamsport S5														

\* Zinc less than .10%. \*\*\* .10% zinc.

\*\* 11-12¢ zinc. † Plus zinc extras.

† Wholesalers only.

## C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
	0.40	0.60	0.80		
Anderson, Ind. <i>G4</i> .....	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. <i>T8</i> .....	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. <i>W12</i> .....		10.70	12.90	16.10	19.30
Boston <i>T8</i> .....	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. <i>R7</i> .....	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. <i>S9</i> .....	8.95	10.40	12.60	15.60	18.55
Chicago .....				15.60	
Cleveland <i>A5</i> .....	8.95	10.40	12.60	15.60	18.55
Dearborn <i>S1</i> .....	9.05	10.50	12.70		
Detroit <i>D1</i> .....	9.05	10.50	12.70	15.70	
Detroit <i>D2</i> .....	9.05	10.50	12.70		
Dover, O. <i>G4</i> .....	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. <i>M8</i> .....	9.05	10.40	12.60		
Franklin Park, Ill. <i>T8</i> .....	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. <i>C11</i> .....			12.90	16.10	19.30
Indianapolis <i>R3</i> .....	9.10	10.55	12.60	15.60	18.55
Los Angeles <i>C1</i> .....	11.15	12.60	14.80	17.90	
New Britain, Conn. <i>S7</i> .....	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. <i>B4</i> .....	8.95	10.40	12.60	15.60	
New Haven, Conn. <i>D1</i> .....	9.40	10.70	12.90	15.90	
Pawtucket, R. I. <i>N7</i> .....	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. <i>A1</i> .....	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. <i>S1</i> .....	8.95	10.40	12.60	15.60	18.55
Trenton, R. <i>R4</i> .....		10.70	12.90	16.10	19.30
Wallingford <i>W1</i> .....	9.40	10.70	12.90	15.90	18.55
Warren, Ohio <i>T4</i> .....	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. <i>A5</i> .....	9.50	10.70	12.90	15.90	18.85
Youngstown <i>R3</i> .....	9.10	10.55	12.60	15.60	18.55





That's exactly what Inland's technical chefs will do when its giant, new sintering plant is completed in June. A single day's mix—4300 tons of iron ore particles, 500 tons of crushed limestone, 250 tons of fine coke—will bake a cake of clinkers which can be fed directly into blast furnaces. Result—better, faster reduction of raw iron ore to pig iron, blast furnace production upped 10%—*more and more Inland steel to feed the hungry production lines of fast-expanding Mid-America manufacturing!*

*Building Today with an Eye to Tomorrow*



### **INLAND STEEL COMPANY**

30 West Monroe Street • Chicago 3, Illinois

Sales Offices: Chicago • Devonport • Detroit • Houston • Indianapolis  
Kansas City • Milwaukee • New York • St. Louis • St. Paul

#### *Other Members of the Inland Family*

JOSEPH T. RYERSON & SON, INC.  
INLAND STEEL PRODUCTS COMPANY  
INLAND STEEL CONTAINER COMPANY\*  
INLAND LIME & STONE COMPANY\* \*Division

## METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

### Iron Powders

#### Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.50
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

### Copper Powders

Electrolytic, domestic	48.25
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	55.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	\$3.60 to \$3.95
Nickel	\$1.05 to \$1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	\$1.07
Stainless Steel, 316	\$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	\$11.25
Tungsten	\$3.15 (nominal)

\* F.O.B., shipping point.

## BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)  
Pct. Discounts

Bolts	1-4 Con- tainers	5 Con- tainers	20,000 Lb.	40,000 Lb.
Machine				
1/2" and smaller x 3"	55	57	61	62
and shorter				
3/8" diam. x 3" and shorter	47	49 1/2	54	55
1/2" thru 1" diam x 6" and shorter	37	39 1/2	45	46
1/2" thru 1" diam. longer than 6" and 1 1/2" and larger x all lengths	31	34	40	41
1 1/2" and larger x all lengths				
1 1/2" and larger x 3" and shorter	55	57	61	62
Carrage, lag, plow, tap, blank, step, elevator and fitting up bolts 1/2" and smaller x 6" and shorter	48	50 1/2	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

### Nuts, Hex, HP reg. & hvy.

	Full case or Keg price
3/4 in. or smaller	62
5/8 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2

### C. P. Hex, reg. & hvy.

3/4 in. or smaller	62
5/8 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2

### Hot Galv. Hex Nuts (All Types)

3/4 in. and smaller	41
---------------------	----

### Semi-finished Hex Nuts

3/4 in. or smaller	62
5/8 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2
(Add 25 pct for broken case or keg quantities)	

### Finished

3/4 in. and smaller	65
---------------------	----

### Rivets

1/2 in. and larger	\$12.85
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7/16 in. and smaller 15

### Cap Screws

Full Finished H. C. Heat Treat

New std. hex head, pack-aged Full Case

3/8" diam. and smaller x 6" and shorter	54	42
3/8", 1/2", and 1" diam. x 6" and shorter	38	23
3/8" diam. and smaller x longer than 6"	..	..
3/8", 1/2", and 1" diam. x longer than 6"	..	..
1/4" through 3/4" dia. x 6" and shorter	59	48
3/8" through 1" dia. x 6" and shorter	45	32
Minimum quantity—1/4" through 3/4" diam., 15,000 pieces; 7/16" through 1" diam., 5,000 pieces; 3/8" through 1" diam., 2,000 pieces.		

### Machine Screws & Stove Bolts

Plain Finish	Discount	Stove
Cartons	Screws	Bolts
Bulk	60	60
Quantity		
To 1/4" diam.	25,000-and over 60	..
Incl. 5/16 to 3/4" diam.	15,000-200,000 60	..
Incl.		

### Machine Screws & Stove Bolt Nuts

In Cartons	Discount	Square
Hex	16	19
Quantity		
In Bulk	25,000-and over 15	16
3/8" diam. & smaller		

## STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.											
Cities	City Delivery Charge	Sheets		Strip	Plates	Shapes	Bars		Alloy Bars		
		Hot-Rolled (18 ga. & hvy.)	Cold-Rolled (15 gage)				Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615	Cold-Drawn 4615
Atlanta	8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24			
Baltimore**	3.10	9.90	10.10	10.16	11.55	10.00	10.65	10.15	11.90	17.48	21.58
Birmingham**		9.43	10.20	10.46	10.91	9.79	10.00	9.50	13.14	16.76	
Boston**	10	10.52	11.27	11.67	12.17	10.42	10.72	10.34	13.45	17.69	21.79
Buffalo**	15	9.80	10.50	11.40	11.30	10.25	10.40	9.90	11.60	17.45	21.55
Chicago**	15	8.69	10.35	11.10	10.35	8.62	9.16	8.79	10.80	17.10	19.70
Cincinnati**	15	8.86	10.41	11.10	10.67	9.00	9.84	9.11	11.68	17.42	21.52
Cleveland**	15	8.69	9.89	11.09	10.47	8.88	9.67	8.90	11.40	17.21	21.31
Denver	20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19		20.84
Detroit**	15	8.95	10.61	11.40	10.72	8.99	9.84	9.10	11.16	17.38	21.48
Houston**		9.65	9.65		10.85	9.65	9.35	8.90	13.10	17.50	21.55
Kansas City	15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	20.37
Los Angeles**		9.95	11.55	12.20	11.55	10.00	10.00	9.10	14.20	18.30	21.30
Memphis	15	8.55	9.80		8.60	8.93	9.01	8.97	12.11		
Milwaukee**	15	8.83	10.49	11.24	10.49	8.76	9.30	8.93	11.04	17.24	21.24
New York	10	9.27	10.59	11.45	9.74	9.87	9.84	10.09	13.35	16.16	20.10
Norfolk	20	8.20			8.90	8.65	9.20	8.90	10.70		
Philadelphia	10	8.30	9.35	10.99	9.35	9.25	9.20	9.50	12.05	16.58	20.08
Pittsburgh**	15	8.69	9.84	10.91	10.45	8.62	9.78	8.79	11.40	17.10	19.70
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30	18.50	20.75
San Francisco**	10	11.00	11.95	13.50	12.25	11.00	10.95	10.75	15.20	18.30	21.35
Seattle**		11.55	12.30	12.50	12.65	11.00	10.20	11.10	16.20	18.60	22.70
Spokane**	15	11.70	12.45	12.65	13.30	11.15	11.35	11.75	16.35	17.75	21.58
St. Louis**	15	9.07	10.73	11.48	10.73	9.00	9.76	9.17	11.43	17.48	21.58
St. Paul**	15	8.95	9.46	10.62	10.47	8.75	9.48	8.85	11.64		21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. \*These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—1/4" x 1"; Plate—1/4" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—1/4" x 15/16; Cold-finished bar—C-1018—1" rounds; Alloy bar—hot-rolled 4615—1 1/2" x 2 1/2"; cold drawn—15/16" to 2 1/2" round; Hot-rolled 4140—1/2" to 2 1/2" round; cold drawn—15/16" to 2 1/2" round.

†† 10¢ zinc. ‡ Deduct for country delivery. 1 1/2 ga. & heavier; 2 1/4 ga. & lighter.

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, fct allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	46.00
Electrodeposited	38.50
Brass, 80-20, ball anodes, 2000 lb or more	51.50
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	18.75
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
100 lb (Rolled depolarized add 3¢ per lb)	
Cadmium, 5000 lb	1.30
Tin, ball anodes \$1.05 per lb (approx.).	

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed,	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.70
(Philadelphia price 25.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum	45.50
N. Y.	
Chromic acid, flake type, 10,000 lb or more	30.44

## CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	125.5
Chicago	140.9
San Francisco-L. A.	148.6
Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.	



## Are you getting your 19 minutes?



Recent studies prove the average manufacturer operates at a profit *only during the last 19 minutes of every working day.*

What happens to the rest of the day's output? According to the National Association of Manufacturers, it goes to pay the costs of doing business.

Think what this means to manufacturers attempting to produce profitably with obsolete equipment...with machining unavoidably representing a large part of the manufacturing cost.

The thin line between profit and loss in your operation can well hinge on your taking advantage of modern, high-speed machine tools with ample power, reserve feeds and speeds, and maximum flexibility.

If you have obsolete equipment in your shop, now is the time to look at it closely and critically. The difference between the old and the new may amaze you. Find out now just how much obsolete machines are holding you back.

Why not call in your Gisholt Representative and talk it over with him? He'll give you fair and accurate appraisals of any machine's productive output. Call him today.

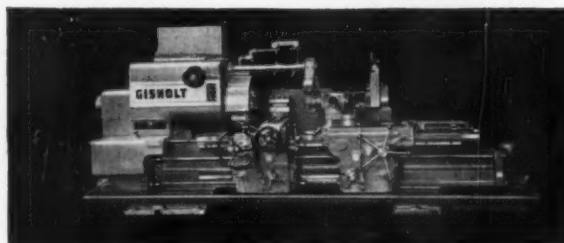
# GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin

**ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE**

THE IRON AGE, December 31, 1959



### Gisholt MASTERLINE Saddle Type Turret Lathe

Rugged headstock gear train provides 24 different forward speeds—all from a single-speed motor, for full power on all cuts.

Hydraulic speed selector permits effortless speed shifts without stopping spindle or shifting gears.

Here's a rugged, powerful machine that delivers maximum output and accuracy from today's carbide tools—and has ample reserve to meet tomorrow's tooling requirements.

Contact your Gisholt Representative today for full details.

Gisholt Machine Company  
Madison 10, Wisconsin

- ☐ Send Saddle Type Turret Lathe Literature.
- ☐ Have Gisholt Representative call.

Name.....Title.....

Street Address.....

City.....State.....



# FERROALLOY PRICES

## Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si...	37.25		
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si	28.25		
0.025% C (Simplex) .....	36.75		
5-7% C, 61-65% Cr, 5-8% Si .....	22.00		
5% max C, 50-55% Cr, 2% max Si..	25.00		

## High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

## Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C .....	\$1.29
9 to 11% C, 58-91% Cr, 0.75% Fe...	1.38

## Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/8" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads .....	\$1.15
Ton lots .....	1.17
Less ton lots .....	1.19

## Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk .....	28.25	14.60
Ton lots .....	33.50	16.05
Less ton lots .....	35.10	17.70

## Calcium-Silicon

Per lb of alloy, lump, delivered, packed, 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk .....	24.00
Ton lots .....	27.95
Less ton lots .....	29.45

## Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.	23.00
Carloads, bulk .....	26.15
Ton lots .....	19.95
Less ton lots .....	27.15

16-20% Ca, 14-18% Mn, 53-59% Si.

## SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.

Ton lots .....	\$1.15
Less ton lots .....	22.40

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots .....	18.45
Ton lots .....	19.95
Less ton lots .....	21.20

## Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk .....	19.20
Ton lots to carload packed .....	21.15
Less ton lots .....	22.40

## Ferromanganese

Maximum base price, f.o.b. lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

	Cents per-lb
Producing Point	
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 68 pct Mn:	
Carloads, bulk .....	14.80
Ton lots packed in bags .....	17.20

## Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	\$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

## Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed .....	45.75
Ton lots .....	47.25

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads .....	34.00
Ton lots .....	36.00
250 to 1999 lb .....	38.00
Premium for Hydrogen - removed metal .....	0.75

## Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn .....

	25.50
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## Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk)			
P, 90% Mn .....	37.15	39.95	41.15
0.07% max. C .....	35.10	37.90	39.10
0.10% max. C .....	34.35	37.15	38.35
0.15% max. C .....	33.60	36.40	37.60
0.30% max. C .....	32.10	34.90	36.10
0.50% max. C .....	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ..	28.60	31.40	32.60

## Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk .....	12.80
Ton lots, packed .....	14.45
Carloads, bulk, delivered, per lb of briquet .....	15.10
Briquets, packed pallets, 2000 lb up to carloads .....	17.50

## Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.

## Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
98.25% Si, 0.50% Fe .....	24.95	22.00
98% Si, 1.0% Fe .....	24.45	21.50

## Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk .....	8.00
Ton lots, packed .....	10.80

## Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.80	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

## Ferrovandium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth .....	3.20
Crucible .....	3.30
High speed steel .....	3.40

## Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots .....	\$2.05	\$2.95	\$3.75
100 to 1999 lb.	2.40	3.30	4.55

Alseifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk .....	9.85¢
Ton lots .....	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo .....

	\$1.50
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Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound

Ton lots .....	\$3.45
Less ton lots .....	3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta .....

	\$3.40
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Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo..

	\$1.76
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Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton .....

	\$120.00
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10 tons to less carload .....

	\$131.00
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Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti .....

	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti .....

	\$1.50
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Less ton lots .....

	\$1.54
--	--------

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton .....

	\$255.00
--	----------

Ferrotungsten, 1/4 x down packed, per pounds contained W, ton lots delivered .....

	\$2.15 (nominal)
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Molybdenic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. ....

	\$1.49
--	--------

bags, f.o.b. Washington, Pa., Langeloth, Pa. ....

	\$1.38
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Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump .....	18.50¢
Ton lots, packed lump .....	20.50¢
Less ton lots .....	21.00¢

Vanadium oxide, 86-89% V<sub>2</sub>O<sub>5</sub> per pound contained V<sub>2</sub>O<sub>5</sub> .....

	\$1.38
--	--------

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk..

	26.25¢
--	--------

12-15%, del'd lump, bulk-carloads .....

	9.25¢
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## Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload .....	\$5.50
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Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound .....

	80¢
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Corbortum, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound .....	18.25¢
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Ferroboreon, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots...

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up	
10 to 14% .....	.85
14 to 19% .....	1.20
19% min. B .....	1.50

Grainal, f.o.b. Cambridge, O., freight allowed, 100 lb and over No. 1 .....

	\$1.05
--	--------

No. 79 .....

	50¢
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Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

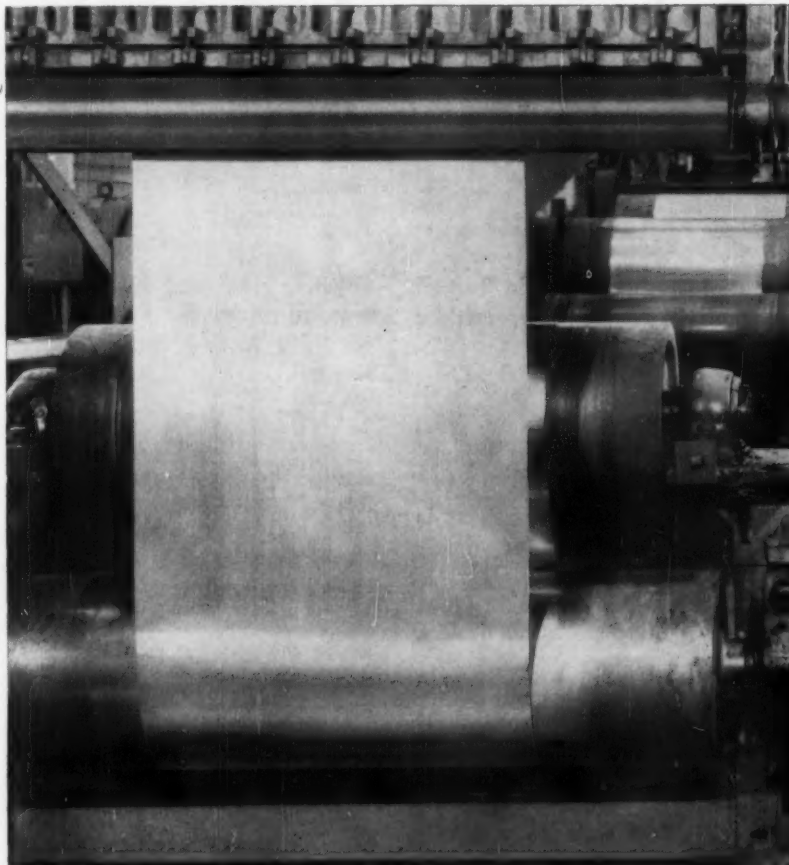
Ton lots (packed) .....	\$1.46
Less ton lots (packed) .....	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots .....

	2.15
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## Continuous Strip Tracking System speeds annealing process



Here, the strip enters the furnace section of the line, under positive alignment and control as provided by the USS Continuous Strip Tracking System.



Continuous annealing line, Kaiser Steel Corp., Fontana, Cal.

A USS Continuous Strip Tracking System like the one recently installed at Kaiser Steel's Fontana plant speeds up tin plate production because it *prevents* mis-alignment, rather than trying to correct it after it happens.

The System provides *constant* control of strip alignment throughout the line, without strip distortion, at speeds up to 1250 feet per minute. The specially designed roll complement, including LORIG-ALIGNER Self-Centering ROLLS, maintains strip material on the pass-line without the use of exterior controls.

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## THE CLEARING HOUSE

# Detroit Market Off, No Upturn Seen

Used machine sales in Detroit are at a terrible low, dealers report.

They don't expect any business upturn even after the steel strike is over.

■ The used machinery business in Detroit is as frigid as the wintery December weather.

The best sales period this year, according to several local dealers, was late summer—August and September. Since then business has steadily declined. The steel strike hurt some. But the general feeling is that the market will not burst forth in full bloom, even if the haze from the steel strike quickly clears away.

**Flooded Market**—Detroit dealers are unanimous in the appraisal that there is too much machinery of practically all kinds around these days. The small shops in the city don't have enough work to warrant the purchase of extra tools. The big auto plants and their suppliers have eyes only for the most up-to-date equipment. They are unloading more used machines than they are buying. The result is a glutted market.

Even an excellent automobile production year, generally a stimulant to the overall Detroit economy, will fail to stimulate interest in used machinery next year. At least this is a popular conception. The auto factories have all the tools and machinery they need to take care of the 7 million car year that is shaping up for 1960. They don't need

anything else. And any machines required to turn out tools and dies for 1961 models were purchased this fall.

**Export Helps**—Most of the buying is being done by out-of-state companies. One estimate is that 50 pct of Michigan's used machines are being bought by out-of-staters, primarily Californians.

One dealer cited an example of the current buyer's market prevailing in the Motor City. He told of a British machinery dealer who came to Detroit three years ago and unloaded a horde of equipment at a great profit. Last month the Englishman returned to Detroit, in eager anticipation of similar good fortune. He was fooled.

**Little Demand**—This doesn't mean there aren't some items in demand. There are. An auctioneer said Acme-Gridley 1¼ in. screw machines are popular and scarce. He said he'd been hounded by a customer for such a machine and couldn't come up with a suitable one. He said he scanned the newspaper ads and stalked the auctions without success.

Interest is also high for ultra-highspeed production equipment, especially grinders and drilling machines.

Auctions are still drawing heavy crowds. "For some reason," said a dealer, "there are so-called bargain hunters who would rather pay 30 pct more for a machine at an auction than they would pay a reputable dealer for the same machine."

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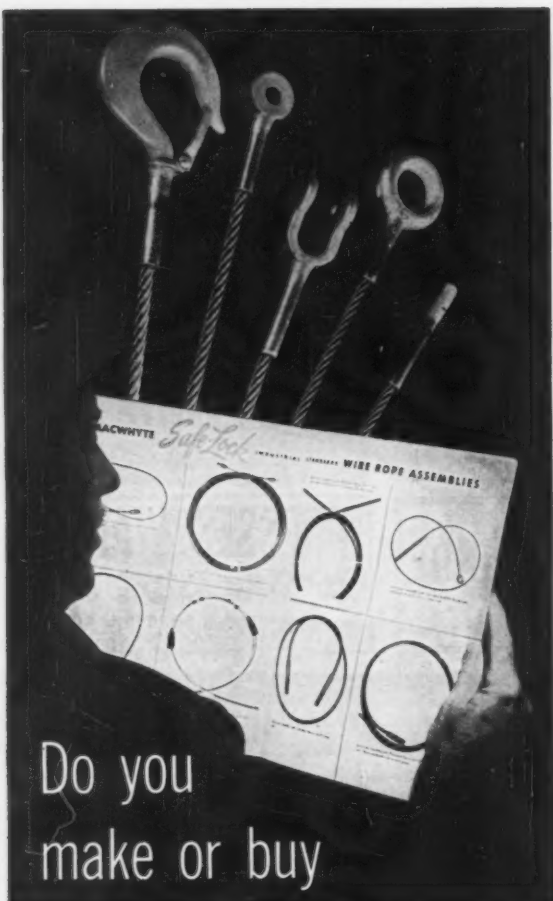
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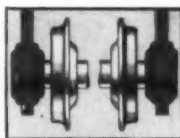
Our representative will be pleased to call at your convenience to discuss your requirements for this or any other type of industrial car. For more information, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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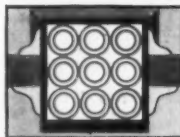


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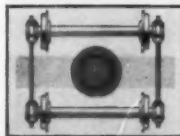
**Anti-friction outboard bearings:** High-capacity anti-friction bearings are located *outside* each of the car's eight wheels to minimize sideways and to provide long, smooth-running performance.



**Seventy-two coil springs:** Nine coil springs between each two wheels on both sides of the car—plus nine overload coils *inside* these—provide a total of 72 separate springs for a shock-absorbed *level* ride, so important in hauling molten metal.



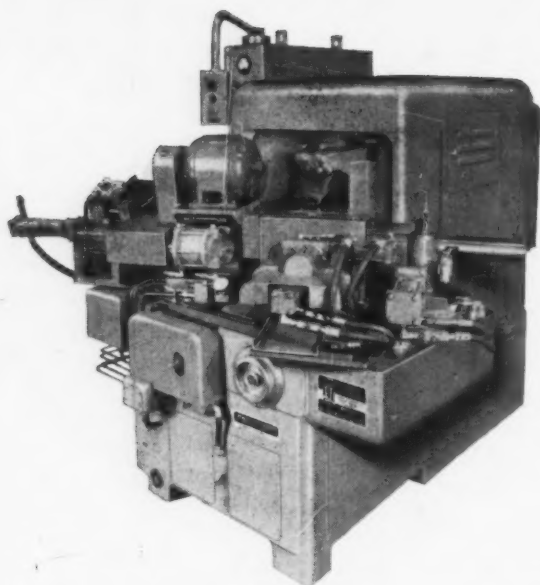
**High engineering safety factor:** Designed for a 200-ton normal capacity load—including ingots, molds and stools—each car has a substantial built-in safety factor to withstand maximum ingot-stripping thrusts.



**Oversize center plates:** "Beefed-up" center plates between the trucks and car body are 18 inches in diameter—compared with the conventional 12 inches—to reduce the load per square inch on their surfaces.

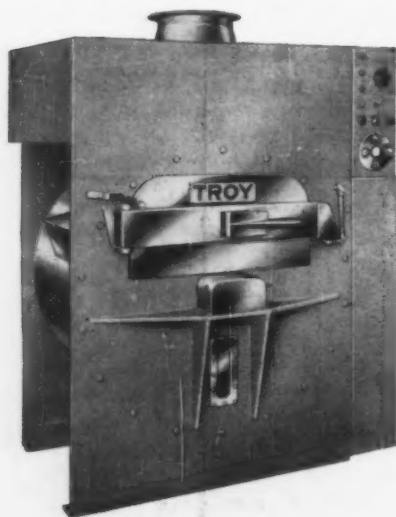


**Hot-metal shields:** Curved end plates, long side skirts, and special drip shields protect the couplers, bearings and springs from runover molten metal and troublesome solidified drippings.



Jones and Lamson Machine Company's Automated Model E Form Grinder is designed to grind the helical form on a steering worm for a major automotive manufacturer. Cutler-Hammer Motor Control is supplied with these machines.

Miller Electric Manufacturing Company, Inc. installs Cutler-Hammer Three-Star Contactors on their Gold Star SR-400 Rectifier Type D-c Welders because, "Our use of Cutler-Hammer Contactors has completely eliminated contact welding and inter-phase or line-to-load flash-over."



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# ...the mark of better machines

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